

AUTOMOTIVE INDUSTRIES

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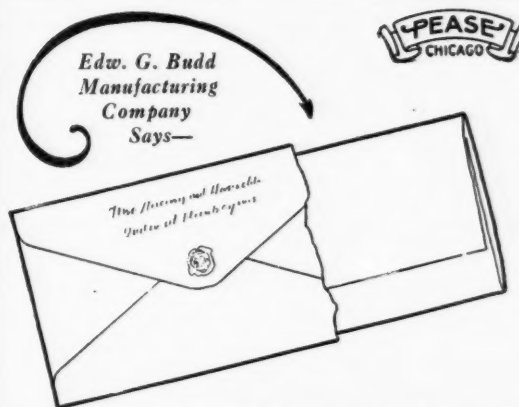
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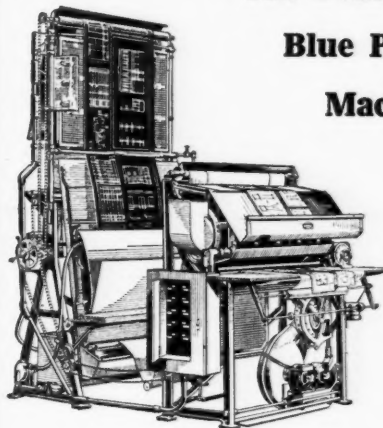
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Record-Breaking Export Business Expected to Continue

Overseas shipments of parts also at high point. Good conditions in foreign markets now general, with very few weak points.

By George E. Quisenberry

BEHIND the record export shipments of the first half of this year is a story of broad development and progress and the promise that the rest of the year will be equally prosperous.

A survey of the export field justifies the statement that the outlook, for nearly all countries, is the best that it has ever been. At no time in the history of our sustained export business, which roughly covers the period since the post-war adjustment, have satisfactory conditions been as widespread as they are today. In each of these years, there have been certain major territories that were not in the buying column, territories where business in general was depressed or where the automotive business had not progressed so that it could be considered a real factor.

Generally speaking, it is difficult today to point out a territory that is not in good or promising condition. Two years ago, Argentina went through a slowing down that cut the automotive buying to a marked degree. Last year, New Zealand went into a sustained depression and a little later, Australia, the premier buyer of them all, facing financial restrictions and the necessity of a thorough trade readjustment, slumped off to an extent that was decidedly harmful. This list might be lengthened but, in a nut-shell, during each of the past years, the export manager has been able to point to this, that or the other country in which his immediate sales were limited or declining.

Today, the picture is changed. The only territories concerning which any doubt need be expressed are Cuba and those rubber producing sections of the Far East which of course have been badly hit by the slump in rubber prices. In Cuba, the low state of the sugar market, plus certain other conditions with which the export section of the industry is well aware, continues to cause concern, although the rapid

strides being made in building the Carretera Central (that wonderful highway stretching from one end of the Island Republic to the other) give indication that increased demand is a future certainty. Business has been holding up fairly well, with six months exports of 3464 units this year against 6325 for the entire year 1927. And even in Malaya and Ceylon, where rubber is the chief crop, there are hopeful signs; nevertheless, the drastic reduction in income cannot have any other effect than that of restricting the automobile business.

Perhaps some other small territories might be singled out for adverse comment. But the bigger and important territories are all back in the buying column. Europe has extended its automobile buying by leaps and bounds. Germany, for instance, took 8799 U. S. cars and trucks in the first six months, against 9248 all last year. The depression ran its course in Argentina. Exports of that country's products ran up to astonishing totals, giving that country a decidedly beneficial balance of trade that shot its currency back to par and unloosed the flood of buying that has lately been experienced, bringing the first half year's exports from the United States to 24,087 vehicles against 22,429 in the corresponding period of 1927. New Zealand, similarly, has reversed the position of a year ago, due to various reasons, and is resuming her forward march as an automobile nation, one of the greatest in the world when we consider per capita ownership. Six months business this year was over 72 per cent of the total for last year, with the biggest months yet to come.

We must next look at Australia, a market of paramount importance. Australia was the first territory to attain heavy automotive buying after the slump in 1921. It bought heavily in 1922, increased those takings in 1923, and further extended



its buying in each of the succeeding years of 1924, 1925 and 1926, a development that but few industries can boast. Then came 1927 and for a few month's early in that year, the great Commonwealth of the Antipodes appeared to be heading for a still further enlargement.

But the pace was too swift. A slackening up became necessary, resulting from various factors, including droughts, poor crops, financial stringency, trade problems, overstocking, etc. Save only for the state of Western Australia, which has been undergoing a special development of its own, the entire territory went into a slump—New South Wales, Victoria, Queensland, South Australia and even the little island of Tasmania.

Heavy Farm Crops

As with Argentina and New Zealand, much water has gone over the dam. In the recent months, most all sections have been blessed with plentiful rainfall and there is every prospect for bumper harvests of wheat and wool, the returns for which will be enriching the farmers about the time that the industry is trekking to New York for the 1929 motor show. Likewise has the trade in Australia been undergoing marked progress and development. Many of the less experienced and businesslike elements that were attracted to it during the "boom days" prior to 1927 have fallen by the wayside and the more solid and substantial houses, better financed and more capable, have organized (or in many cases, reorganized) for the new conditions that are confronting them—conditions admittedly of keen competition but likewise of swelling business.

Already this new note is apparent in the Australian trade. So also is the increased buying that the new season is bringing about. Many Australian distributors, wholesalers and dealers have been in America within the past few months and others are en route. The writer has talked to many of them and he has lately had the very fortunate experience of much contact direct with the Australian trade and almost without exception the outlook is reported as being much changed for the future. Australia is again a factor, but there has not yet been time for the better conditions to show in the export figures, which for the first six months this year declined almost 33 per cent.

In passing, mention might be permissible of the fact that the spirit of the Australian tariff administration seems to have changed in some degree. Most Australian visitors talk of this, saying that since Prime Minister Bruce has taken the customs directly under his wing, the former policy of unlimited protection granted to any attempt to manufacture within the Commonwealth is to be less rigidly followed. It is not that there has been any "softening" of the tariffs already enacted or any likelihood that the general policy of Empire preference will be changed but it is a belief, generally expressed, that the Commonwealth customs will not be so arbitrary or so prone to change upward.

There is of course much more to our export business than the several territories which have been mentioned here. Our present volume of considerably more than half a million automobiles a year, with a total value for all products in excess of half a billion dollars, is made up not from a few large territories but from a great outpouring of buying from all of them. Roughly speaking, the only sections in which we are not now doing business are those protected by the French tariff wall and there are some such territories that are now buying from our makers. We sell some automobiles (together with certain of the complementary products) in France and even in Algeria and Morocco. Very little business is going into French Indo-China but there as well certain lines have worked up some business.

A surprising development of the present year is the so-called "American automobile invasion" of Italy. Our lines are beginning to sell in some volume in the country of Mussolini, which, like France, has erected a very high tariff wall for the protection of its own automobile industry. But that wall has been jumped and it is noteworthy that the recent automobile exposition at Milan was almost an American show. Twenty-three American makes were exhibited, more than twice as many as those of any other country. When it is considered that no more than 28 American makes are scheduled for exhibition at this year's Paris Salon, the fact that 23 of them were at Milan is almost astounding. Six months' exports to Italy from the United States were 1776 units, against 1048 all last year.

The whole course of our trade this year has been rather surprising, although those who have followed our export business closely have realized for months that Europe had attained a leading position in our export strategy. The rather frantic efforts a few months ago of several European makers, principally emanating from Italy but supported in spirit at least from Germany, to organize the "European cartel" to repel the American onslaught by parceling out markets was of course an evidence of the strength of the American industry in Europe.

It is due to several things. One is that our makers have gone out to develop the European markets—that is, they have sought out the buyers rather than letting the buyers come to them. This has created a demand that the European makers did not foresee and consequently were not prepared to supply when it exerted itself. Then, they have demonstrated that, by and large, the European has a leaning to the more powerful type of car that we build. In other words, the light car of 6 to 12 hp. depends for its sale upon the artificial protection of horsepower taxes or other similar provisions.

In addition to these several considerations, is the fact—which many of us have believed for a long time—that we are actually building better cars and more handsome cars than are the Europeans. Not of least importance is the fact that the financial position of Europe is better than it has been any time since the war. A good deal of our sales there this year have been the result of this greater prosperity but the whole story takes in other things. It takes in also the fact that the German tariffs have been lowered this year and likewise that we are better organized, know our jobs better and are more aggressively pushing the European business.

Financing Facilities

Little has been or can be said about the effect on our export markets of the wider influence of American acceptance company operations abroad. Only a short time ago, there were literally no facilities for retail financing abroad and not much for wholesale purposes. Now, in addition to finance operations of a purely local nature in certain countries, four or five American companies are extending their facilities into various sections of Europe and Latin America and are prepared to extend to other sections of the world should the demand express itself.

Two new assembly plants have been announced for operation during the past few months, both by General Motors. One of these is at Warsaw, Poland, and the second is at Bombay, India. India has been admittedly one of the most difficult of all sections. Instead of being one market, India is several markets, so widely separated that a single plant could not serve them all. The fact that General Motors is now encouraged to commence operations at Bombay reveals the growth of

that market.

In closing, some reference should be made to the Ford position abroad. The new model has long ago been demonstrated and had its first public appearance all around the world. One of the last markets in which it was shown was in Australia where it was uncovered on May 15, to large crowds and much the same excitement that greeted it in this country and elsewhere. Comparatively limited production

has been commenced in any of the Ford plants abroad and it was not until July that the first model came off the lines in the big plant at Copenhagen. Other plants have been slow to commence deliveries but Mr. Ford is quoted from Detroit a few days ago as declaring that overseas assemblies then were running at 400 units daily. In addition, the Canadian plant was producing 500 units daily, of which a considerable share is undoubtedly going as export to the territories controlled from Canada. But commencing in June and July, Ford

Six Months' Exports—1928 Compared with 1927 United States and Canada

	1928		1927	
	No.	Value	No.	Value
U. S. Passenger Cars	194,309	\$140,224,661	159,781	\$117,156,945
U. S. Trucks	58,957	40,868,474	54,748	34,562,184
U. S. Total	253,266	\$181,093,135	214,529	\$151,719,129
Canadian Cars	*	*	25,335	12,901,980
Canadian Trucks	*	*	10,760	3,629,468
Canadian Total	26,751	\$ 12,867,918	36,095	\$ 16,531,448
Total U. S. and Canada	280,017	\$193,961,053	250,624	\$168,250,577
U. S. Parts for Assembly		\$ 29,645,376		\$ 26,152,609
U. S. Parts for Replacement		\$ 25,087,990		\$ 22,614,200

* Details not available.

began heavier shipments abroad of the new models and shipping reports from New York indicate an increasing volume of these cars and trucks, the extent of which can only be conjectured at the moment of writing.

But the record export business of the first half of the year was achieved without including any appreciable volume of Ford business. Last year, the export volume was kept up to practically the 1926 level by

enlargement of the shipments of all makers other than Ford, a condition that was not the case in the domestic market. The first half of this year other makers more than made up the Ford loss in business.

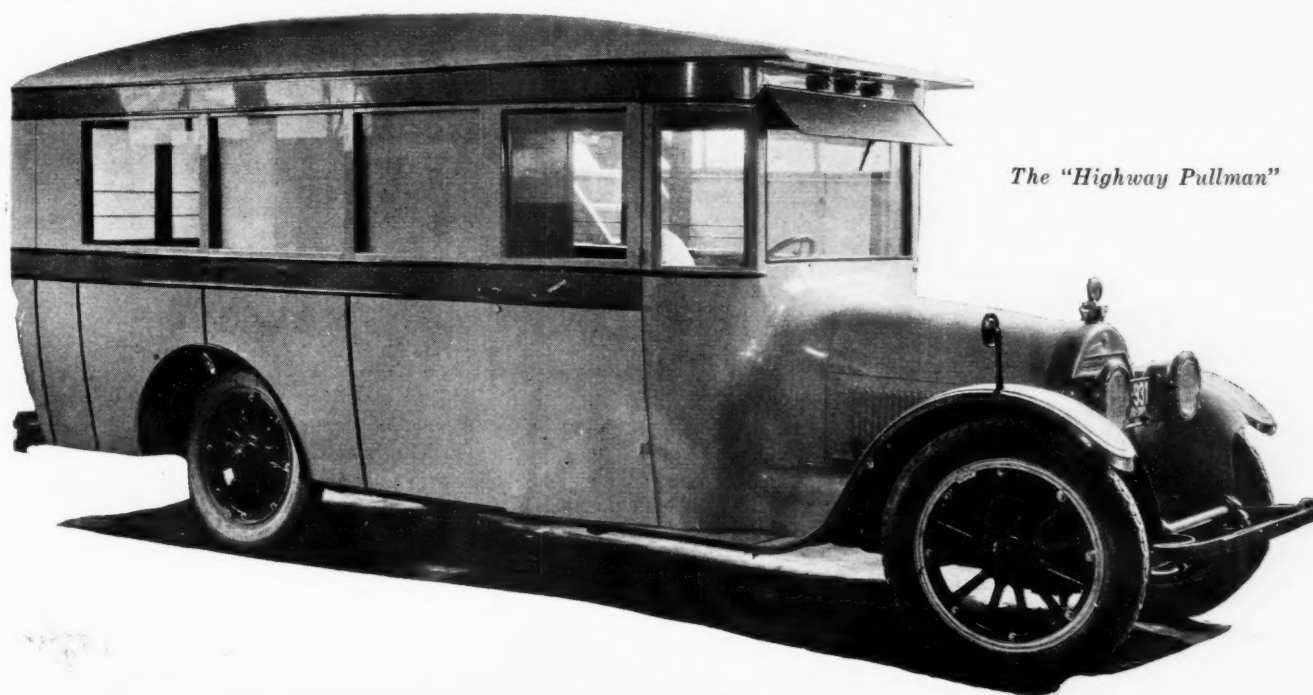
Now it is evident that Ford is about to sell more heavily abroad and will resume his pioneer work, which has been so important a factor in these overseas markets. The general results should be to stimulate all makes, as many local companies report that the absence of Ford from their market has retarded business.

"Highway Pullman" Designed for Tourists

OSCAR FREY, a body engineer of Lima, Ohio, has designed and built a new type of tourist body of which an illustration is shown herewith. This job, known as the Highway Pullman, was designed to meet the needs of the automobile tourist and the traveling man who uses a sample car.

There are sleeping accommodations for four people.

When not in use the berths fold up in Pullman-car style. The equipment includes a chemical toilet, a folding lavatory, a shower bath, a clothes closet and a kitchen with refrigerator. The body is 73 in. high, 85 in. wide and 175 in. long, and it is mounted on a Cadillac chassis that was lengthened to a wheelbase of 154 in.



The "Highway Pullman"

Light Thrown *on* Rear Axle Design by New Performance Tests

Special Timken set-ups disclose hitherto unknown data for determining actual performance characteristics of existing designs, and for development work.

By P. C. Ackerman

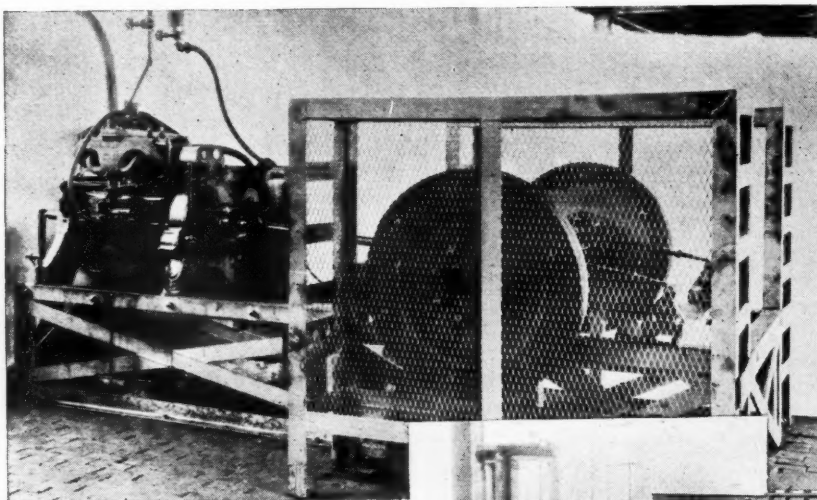
Assistant Chief Engineer, Timken Roller Bearing Co.

PROGRESS in automotive engineering is rapidly reaching the point where the fundamentals and major problems being pretty well settled, attention is being turned more and more to the refinements of existing designs and their effect on the overall efficiency of the vehicle in question.

Before the problems involved can be solved with any degree of accuracy, however, their true nature must be known; in other words, the engineer must have exact knowledge of what takes place in a given piece of mechanism, under all sorts of conditions, before he is in a position to apply corrective measures. Obtaining

the service, an engineering laboratory has been established that is equipped to make a wide variety of tests either to determine the actual performance characteristics of existing mechanisms, or furnish data that may be helpful in the development of new designs. The engineers in charge of the laboratory have devised a number of standard tests, calculated to give accurate data on hitherto rather obscure phases of gear and bearing operation in transmissions and rear axles. Some of these tests are interesting because of their novelty; all are interesting in the light of the assistance they have given toward overcoming difficulties and pointing out the remedies for design and constructional faults in the parts that have been tested.

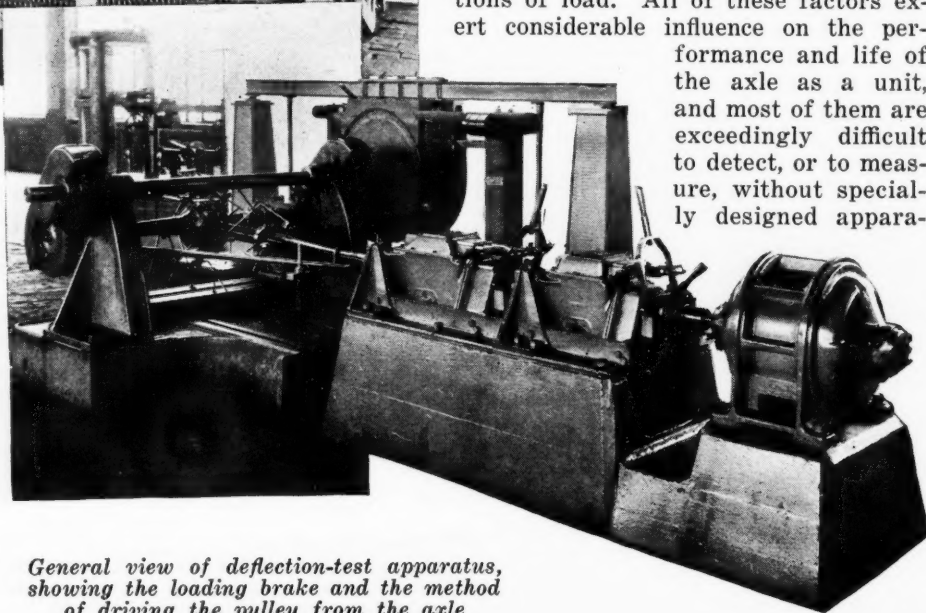
One of the tests that is of special interest from both standpoints is what is known as the deflection test for determining the characteristics of pinion and ring gear operation in rear axles. It is conducted with special reference to obtaining information on deflections under load in a rear axle; that is, the amount of pinion lift and give, the amount of ring gear lift or give, the horizontal or vertical spread of the differential-carrier legs, and the differential distortion, under different conditions of load. All of these factors exert considerable influence on the performance and life of the axle as a unit, and most of them are exceedingly difficult to detect, or to measure, without specially designed appa-



Apparatus used in the "laboratory road test"

such knowledge is often expensive, so much so that in many instances it is economically impractical.

A realization of this situation, together with a thorough conviction as to the value of such information to the progress of automotive engineering generally, has led the Timken Roller Bearing Co. to institute an engineering service that is at the disposal of any manufacturer of automotive equipment. In connection with

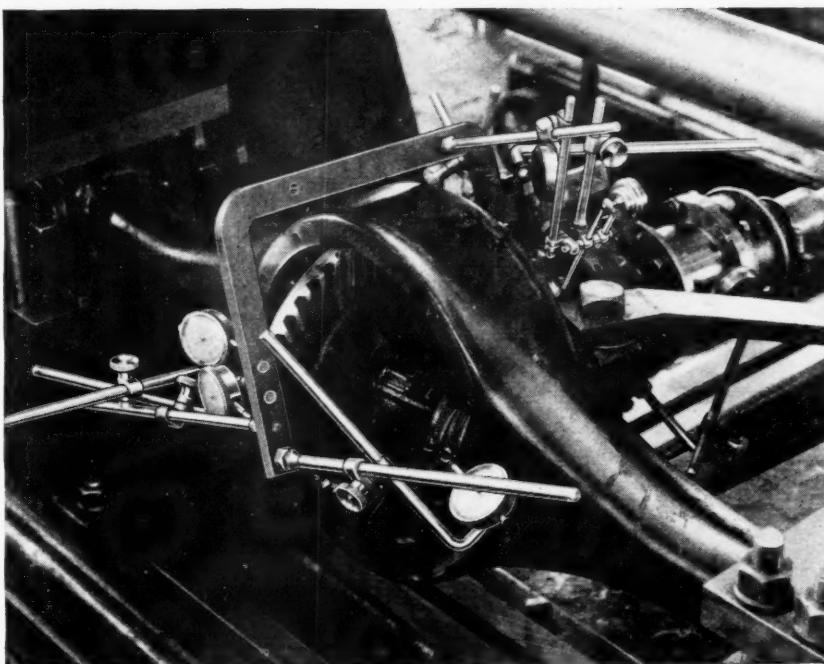


General view of deflection-test apparatus, showing the loading brake and the method of driving the pulley from the axle

tus. The test has an additional value in that it can be made to serve as a check on the effectiveness of any corrective changes that may have been adopted as a result of conditions disclosed by the preliminary test.

The apparatus used in conducting this test is shown on the preceding page. It consists essentially of a 1200 r.p.m., 2 hp. motor, driving the pinion shaft of the axle to be tested through two seven-speed transmissions with a total maximum reduction of 100:1. The axle shafts are coupled to two gears, which in turn drive a countershaft, on one end of which is a large drum, or brake pulley, which is water-cooled. This pulley runs in a mechanism which operates on the principle of a Prony brake, and which consists of an adjustable band surrounding the pulley, and fastened to a beam extending 5 ft. on each side of the drum to a pillar which in turn rests on weighing scales. Thus the loads can be measured for both directions of rotation.

The load is adjusted by altering the tension of the brake band, and the actual amount registered on the weighing scales. In practice, the axle to be tested is set up as indicated, and the loading apparatus is adjusted for various steps corresponding to those from no load to full torque load of the car or truck in low gear. The deflections of the various parts are read directly from a number of indicators which bear on the different parts to be checked. The indicators are mounted on a common yoke which is clamped around the pinion shaft housing. This mounting is shown on this page. After the complete series of readings at



Close-up view of an axle undergoing a test, showing the method of mounting the indicators

different loads in both directions of rotation has been taken, the results are plotted to form a series of curves. These, when analyzed, give very definite clues to actual conditions in the axle, and quite often are the means of suggesting whether or not changes in design or construction should be incorporated to eliminate potential causes of trouble.

This test is as useful for determining the effectiveness of whatever measures may be adopted to prevent troubles

as it is for disclosing the original conditions. An example of such a case is shown by the two curves in Figs. 1 and 2, which are results obtained from an actual rear axle test. It will be noted that the curve in Fig. 1 indicates spreading of the differential carrier legs, caused by a combination of forces acting upon them that tends to increase rapidly with the increase of engine torque. As a result of this disclosure, a very simple change was made in the design of the housing with a view to limiting the leg spread. The curve in Fig. 2, which is the result of a test on the axle after the change was made, shows what a decided improvement resulted. Thus the builder of the axle in question can be assured that the changes that are being made are actually productive of the desired results, or, if the reverse is true, that some other method may be found to eliminate the trouble.

Another test that has been established to provide accurate data on rear axle performance is one known—for lack of a better term—as the “four-square” test. It is particularly valuable as a life test of the gears and bearings, but it also affords considerable information

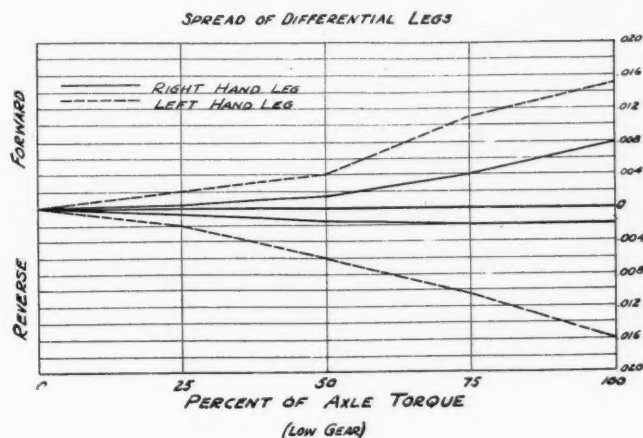


Fig. 1—Spread of differential carrier legs as plotted from readings of an indicator on a rear axle

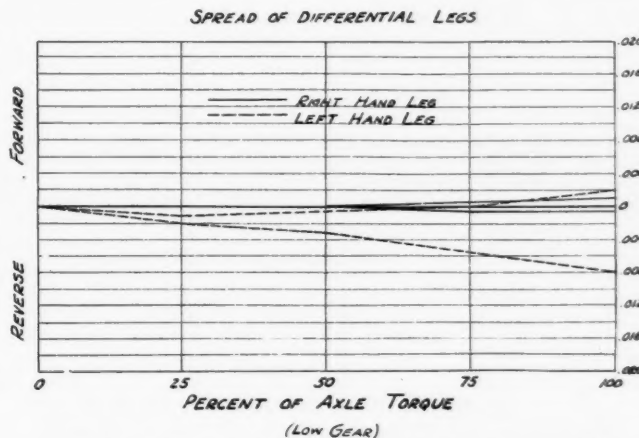


Fig. 2—Spread of differential carrier legs as plotted from indicator readings obtained after corrective measures had been applied

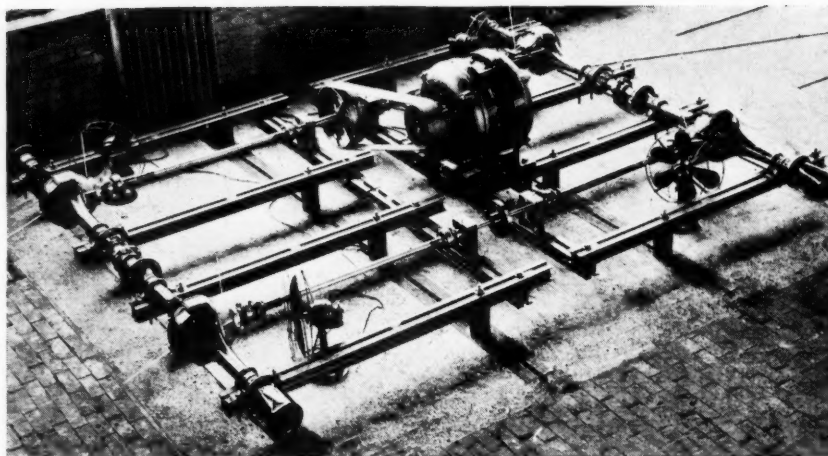
as to the performance of propeller shafts at various angles of inclination. In this test four rear axles, complete with propeller shafts, are set up so as to form a closed torque circuit. That is to say, they are arranged in the form of a square, the adjoining shafts of each pair being connected by a semi-rigid coupling, and the propeller shafts of

the two outer sides of the square being also connected as shown. The differentials are locked, and torque, usually equivalent to maximum engine torque, is applied by introducing torsion in all members at the coupling shown just below the motor. The amount of torsion or torque is measured by a system of weights and levers, and when the desired value is reached the system is locked by connecting the coupling. The whole series of axles is driven by a motor, running at about 1200 r.p.m., which supplies only enough power to overcome the frictional resistance.

The test is run to destruction, hence its duration is variable; good axles will last several hundred hours before failure of some part occurs. In poorly designed axles, failures have occurred in less than 100 hours. During the test the direction of rotation is reversed every 25 hours, and that of loading every 50 hours. This system of rotation and load reversals has been adopted so that all four axles will undergo exactly similar conditions during the test. In other words, given any particular direction of rotation and load, the pinions of two axles are driving the ring gears, while in the other two the gears are driving the pinions; in other words, coasting conditions prevail. Reversing the direction of rotation equalizes the conditions only as far as the lubricant supply is concerned. But reversing the direction of load means that the gear and pinion teeth of all four axles will be subjected to exactly the same conditions of load, and, consequently, of tooth pressure. During the test an accurate record is kept also of temperature conditions as being an indication of internal conditions in the axle.

After completion of 100 hours of the run, the axles are disassembled, and the gears and bearings carefully inspected. This procedure is repeated at intervals throughout the run. Since the test conditions are very severe on both gears and bearings, any signs of weakness, or of abnormal operation, are usually quite easily detected. The information thus gained also serves to some extent to expose conditions that may be avoided, or remedied, by changes in design and arrangement.

The rear axle test illustrated was designed to simulate actual road conditions as nearly as possible, to determine bearing and gear performance under the different conditions met in service. As a matter of fact, however, it is really more severe than anything liable to be found in service. The axle to be tested is supported on springs, which suspend it over a heavy frame. A heavy flywheel is mounted on each axle shaft, and the propeller shaft is coupled directly to a four-cylinder



General view of set-up for the four-square test. The fans are used to produce an air current similar to that under the car or truck when in motion

gasoline engine. The flywheels are so constructed that their weight can be adjudged to duplicate any particular car or truck weight desired. The engine is equipped with a speed control governor whereby the engine speed is periodically and automatically accelerated from that corresponding to a road speed of 15 m.p.h. to 50 m.p.h. This is

accomplished by a device on the governor that throws the engine throttle open to a predetermined point. By altering the positions and size of weights attached to the flywheels, various road conditions can be simulated, such as roughness or smoothness, levels, or grades. Thus the performance of the axle parts can be checked under every condition met in actual service, speed, car weight and road conditions. It is also possible, by means of windows let into the housing, to observe the effectiveness of the lubricating system under the different conditions met with in service, a thing that is impossible during the normal road test.

German Transport Grows

IN Germany there exists a motor road transport organization under the title Kraftverkehr Deutschland B.m.b.H. (which might be translated as Motor Transport Germany, Inc.) that does a transport business on a national scale. The organization was originated shortly after the war to make use of surplus army trucks. Originally it was operated by the Government but later a private company was organized and the business transferred to it. When the services were started the chief activity was the transportation of freight and express goods, motor bus services being conducted by the Post Office Department, besides which the vehicles taken over did not lend themselves so well to passenger transportation. The whole enterprise was divided into a considerable number of branches, each operating in one province or state.

In the course of time the passenger-carrying business has grown considerably, while the freight-carrying business also has been enlarged. The present status of the organization is reflected by figures recently published in an annual report.

On Dec. 31, 1927, the Motor Transport operated a total of 425 routes of a total length of 5500 miles. Of these 380 lines were passenger-carrying lines and 45 freight-carrying lines.

During the year 1927 the companies carried 49,000,000 passengers and passenger-carrying operations amounted to 16,000,000 vehicle-miles. The average equipment consisted of 860 buses. Each bus therefore covered about 18,600 miles and carried 57,000 passengers. The average complement of passengers was 15, so that the average length of ride was about 5 miles.

The freight services in 1927 amounted to 6,200,000 truck-miles, as compared with 4,500,000 in 1926.

Just Among Ourselves

Industry's Executives More Active Politically

INDIVIDUAL executives in the automotive industry seem to be more active politically in the current presidential campaign than ever before. In past election years, relatively little was heard about prominent automotive men from a purely political standpoint, but this year, beginning with John J. Raskob's assuming the management of the Smith presidential campaign, automotive names have been creeping into the headlines with surprising regularity. Following Raskob's move, of course, came Pierre duPont's announcement of his active support of the Smith candidacy, but even before that had broken the news that Henry Ford was to be active in the work of the Hoover forces in Michigan. Finally W. C. Durant cables from Europe an offer of a prize for the best plan for enforcing prohibition and placards his definite support of Hoover. More than anything else the public announcements serve to show clearly the absence of any special political consciousness for the industry as an entity. This is to be expected in the light of its history during which it has fought as an industry straightforwardly for those things on which a vast majority of its leaders were agreed as being constructive and has sought and gained the aid of both major parties in the accomplishments of those ends on numerous occasions.

* * *

Opportunities in New Communication Methods

EVERY time science finds some new way of transmitting ideas or conceptions from one human mind to another, the

industrial manager is placed under new difficulties in planning, operating and distributing if he is to function efficiently under the new conditions. In one very large sense every advance in communication aids him in the advertisement of his products; gives him new means by which to communicate to buyers information and sales arguments about them. In another sense, nevertheless, his burdens are increased because when he announces a new automobile model, for example, in one place, he is being asked immediately to supply it to dealers and customers in every part of the world. Before long, it would appear, not only will cables and radio carry to export markets the announcement of a new model at the same time it appears in the domestic field, but also television may flash living pictures of the new cars along with their announcement. The faster and more completely information travels about the world, the more closely must distribution and supply be synchronized with announcements; which simply means that the whole world eventually will have to be taken into consideration from a merchandising standpoint when new model announcements are made.

* * *

Foreign Dealers Want Prompt Announcements

WE were interested not long ago in a request from a New Zealand dealer for a well-known American line who offered to pay for regular cable reports concerning new car announcements in this country. We had assumed that he would be notified of the announcement from his own organization before, at least at the time the new model was announced publicly

in this country. Investigation proved that not to be the case, however. This dealer and others in the same category get that information when the New Zealand branch of this American company deems the time ripe for announcement in New Zealand. Since this company is particularly successful in its foreign work, the method doubtless is good from a practical standpoint. Yet it would seem that as ease of communication continues to grow, simultaneous world-wide announcement of new products will become more and more necessary.

* * *

Good Business Men, Good Golf, Good Gosh!

THERE is an old saying which claims that any executive who shoots eighteen holes of golf consistently under 100 is neglecting his business. We used to subscribe to that theory very strongly, but we're beginning to shift our position on the matter so that if we ever do get under 100 consistently we'll have our alibis well set. In any case, it is apparent that the executives of General Motors Export Corp. are tending strictly to their knitting and attending closely to their business. A recent company tournament reported in the August issue of *General Motors World* shows that only three out of the 22 who completed the 36 holes broke 100. W. T. Whalen had a 99 in the morning round, while C. R. Carrol had 93 and C. R. Evans 98 in the afternoon. J. D. Moonney had a close call in the morning when he got an even 100. The highest gross score was . . . well, why go into the golf question further? Where good fellows and good business men are concerned the goodness of the golf doesn't matter anyhow.—N.G.S.

Unique Locating Method Employed in Finishing *Cylinder Blocks*

Oldsmobile does not depend on bottom surface as means of location, but uses crank holes for accurate line-up during finishing operations on the bores.

By K. W. Stillman

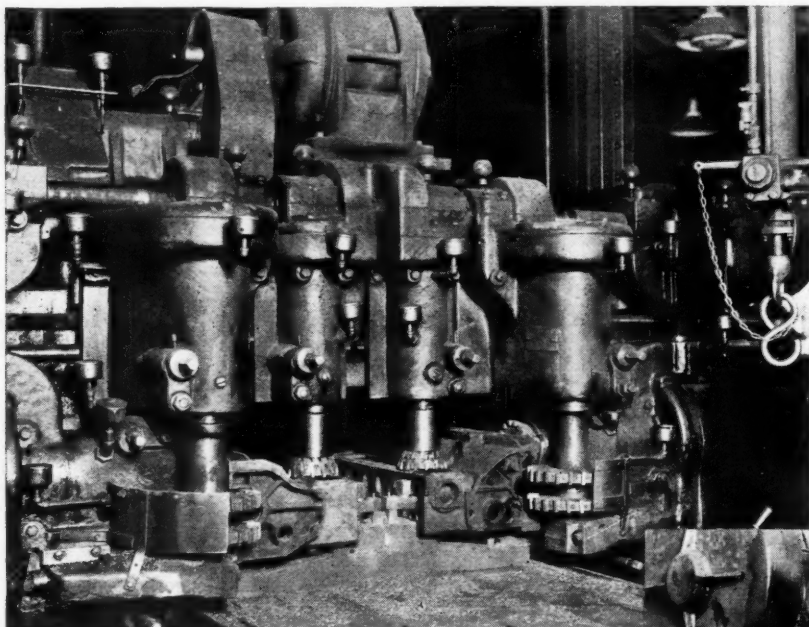
ONE of the most important characteristics of a properly machined cylinder block is that the axes of the cylinder bores shall be absolutely at right angles with the axis of the crank holes. A good bit of the time spent in planning machining operations is devoted to providing proper locating points and surfaces so that this ideal can be attained.

Usually, the method employed provides first for a

receive a spray coat of paint and pass to a plain automatic milling machine equipped with hydraulic feed where the two locating bosses provided on the casting are milled as well as the surface for the manifolds and valve spring covers. In a rail drill, holes are then drilled and counter-bored in the locating bosses—to be fitted with Welsh plugs later—and these holes are used as the major means of location in the next few operations.

The bottom surface and the surface on the side of the block for the water jacket cover is next rough and finish milled in a planer-type milling machine fitted with an indexing fixture which holds 12 blocks. This cut on the bottom surface, incidentally, is the only cut taken there. Since this surface is not used for any accurate locating work and only has the oil pan fastened to it, the two cuts it receives in this operation are sufficient.

Using the finished bottom surface and the two Welsh plug holes as locating

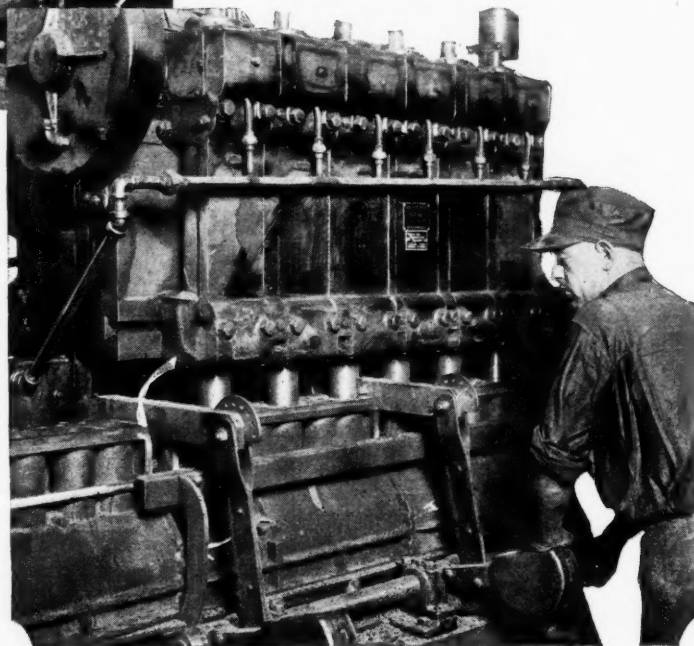


Above—Planer type milling machine rough milling the bottom surfaces and surface for water jacket cover. Two blocks are worked on at once and 12 blocks are mounted in the fixture

flat bottom surface and this surface is used to locate the casting when crank holes and cylinder bores are finished. An unique method being used in machining Oldsmobile blocks eliminates the bottom surface as a means of location for any accurate operations, but employs the crank holes themselves for locating the block when cylinder bores are finished.

In the early operations on the Oldsmobile block the locating pads employed by the foundry are used—later in connection with the bottom surface—but when final operations on the bores commence these points are no longer employed.

After inspection and washing, the blocks re-



Below—Final reaming of cylinder bores. The fixture suspends the block from the crank bore, assuring exact perpendicularity between this and the cylinder bores

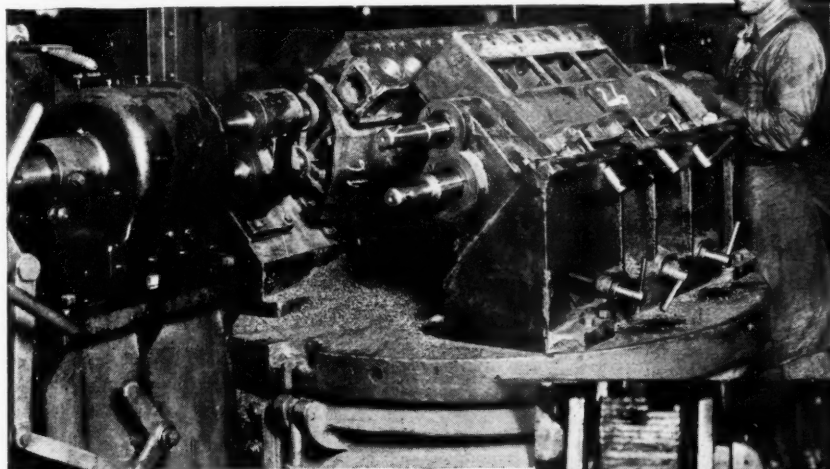
points, the top of the block is rough and finished milled in a rotary type milling machine.

The top surface is next inspected and tested for hardness. Hardness in the cylinder bores, bearings and on valve seats after machining must be within 165 to 195 Brinell.

The next operation is performed in a multiple-spindle drill where 26 oil pan holes are drilled, eight for the bearing spindle and two cap screw holes for oil. In another drill three more holes are drilled—one for the oil pump shaft and two locating holes.

A four-spindle drill is then brought into use for drilling four angular holes to conduct oil from the crank to the cam line, after which the two locating holes previously drilled in the oil pan surface are reamed by means of an air tool.

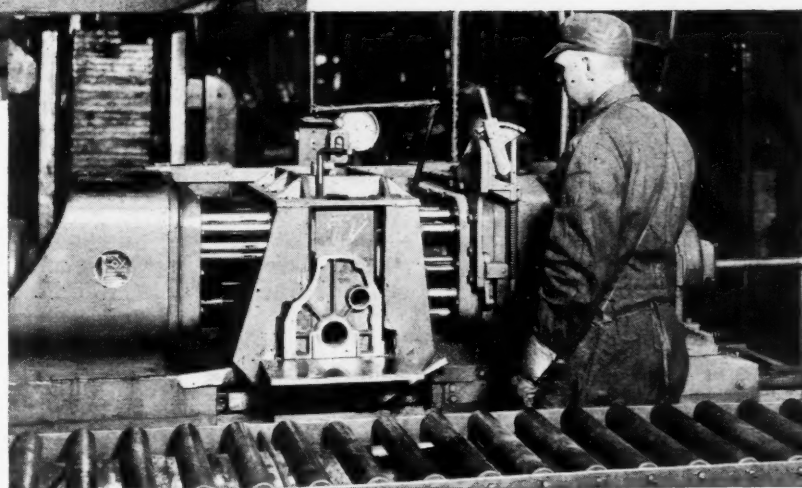
Another multiple-spindle drill is utilized to drill eight



Upper right—First rough bore of cylinders. Blocks are located from bottom surface. The fixture holds two blocks

Above—Double end boring machines for line reaming crank and cam holes. Two blocks are carried in each fixture

Lower right—Two-way multiple spindle drill putting 30 holes in the manifold side of the block and 32 in the oil filler side



dowel holes for bearing caps and the block then passes to a cylinder boring machine where the six cylinder bores are rough bored, two blocks being loaded on the machine at a time. For this operation, since it is merely a rough bore primarily to remove stock, the block is located from the oil pan surface and the locating holes previously provided, these locations giving sufficient accuracy for the purpose of the present operation.

On a fixed multiple-spindle drill the 12 valve openings are rough drilled, using the same locating points as in the preceding operation.

A second fixed multiple-spindle drill is employed to second rough bore the 12 valve openings and to spot drill the valve guide holes. The fixture is then indexed and the valve guide holes are drilled. A third drill is brought into service to semi-finish ream the valve guide holes and valve openings.

Two bench operations follow in which the eight dowel holes for the bearings caps are reamed and the bearing cap screw holes chamfered.

In a multiple-spindle tapping machine 28 holes in the bottom are tapped, 26 for the oil pan and two for the pump body. The eight bearing cap screw holes are then tapped in a multiple-spindle drill and a single-spindle machine drills the hole for the oil pump shaft in the second rib.

The bearing caps are then assembled and tightened down and the crank and cam lines are rough bored in a double-end boring machine. For this operation the same locating points are used as for the milling of the top and bottom of the block, thus assuring that the axis of the crank and cam lines are parallel with the top and bottom surfaces within sufficiently close limits.

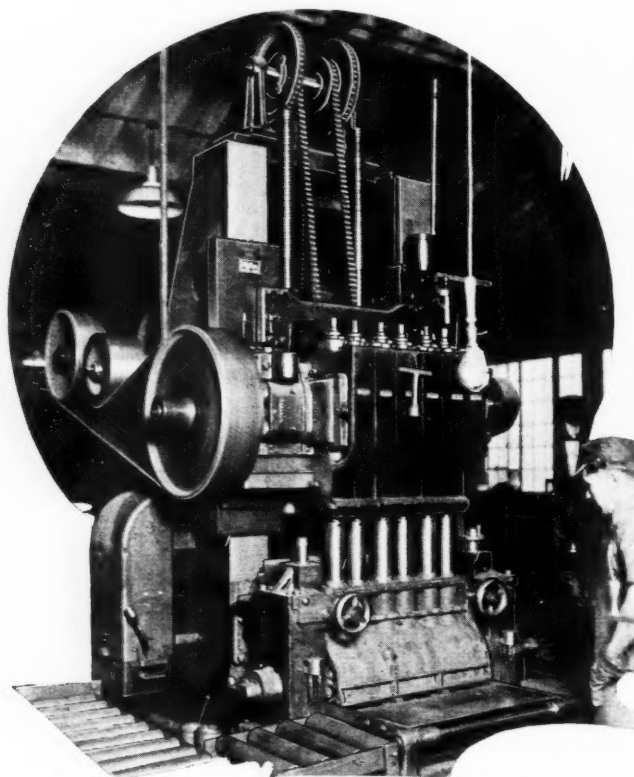
A rail drill is then employed to counterbore for the spring seats on the bottom of the valve guide holes. An indexing fixture permits six holes—every other one—to be bored first, index, and counterbore the remaining six. A water test follows this operation.

In a single-end boring machine the water pump hole is bored and a milling machine is then employed to

rough mill surfaces for the oil pump bracket and the gas pump. Both ends of the block are next rough and finish milled in a drum type milling machine, stock being left on the rear end.

The rear end of the front crank bearing is semi-finish faced in a special miller after which the crank and cam lines are semi-finish bored in another double-end boring machine. The six valve lifter bracket bosses are next milled.

A two-way, multiple-spindle drill comes into action next and drills 62 holes in the block in a single operation. The 30 on the manifold side consists of 10 for the manifold studs, six for the valve covers, six for the valve lifter brackets, four for the oil pump bracket, two



Another view of the final reaming fixture showing how the cylinder block is suspended from the crankhole

for the vacuum pump, one for the oil pipe rear cam bearings and one for the cross shaft.

In the oil filler side, 32 holes are drilled, including 28 for the jacket cover, one for a pipe plug—water drain, one tapped hole under the oil filler boss and one oil hole over the oil filler boss.

The next three operations finish drilling three holes started in the preceding operation but which cannot be finished during the work cycle. These are the cross shaft hole on the oil filler side, a 5/16 in. hole under the oil filler boss and the hole over the boss.

In a two-way, multiple-spindle tapping machine 60 of these holes are next tapped and then a three-way multiple spindle drill is employed to drill holes in the top surface and both ends. In the top, 25 holes are drilled, 17 in the front end and eight in the rear end, after which 41 of them are tapped in a three-way tapping machine.

In the top also, 13 water circulation holes and two dowel holes are drilled in a multiple-spindle drill and the oil filler holes are drilled and countersunk in a single-spindle drill.

A dowel hole and an oil hole are next drilled in the face of the front cam bearing in a special machine and

in a single-spindle drill a 9/16 in. hole in the top for the distributor shaft is finish drilled. Two more drilling operations finish the intake manifold holes and any others which may have been uncompleted in the two-or three-way machines and the crank and cam lines are final line reamed in a third double-end boring machine.

The next operation is to second bore the cylinders and here, for the first time, conventional methods of locating are dispensed with. The fixture for this boring machine contains two drum-shaped plugs which fit into either end of the crank holes and lift the block slightly off its base so that it is suspended from the plugs. The locating bosses near the top of the block are then forced back against stops on the fixture and the boring bars then must be at right angles with the crank line axis regardless of the accuracy of the top or bottom surfaces of the block.

After the second boring the top of the six cylinder holes are chamfered and the holes are reamed.

A lathe is employed to finish face both sides of the front bearing and the cam bearings are then pressed into place, after which the 12 valve guide holes are finish reamed in a multiple-spindle drill. From 0.004 to 0.005 in. is removed in this operation with a tolerance of 0.001 in.

Chamfering Operations

After drilling and reaming a hole in the manifold side for the vacuum pump, the bottom of the cylinder bores are chamfered in a rail drill and the crank and cam lines are hand reamed. Both sides of the front crankshaft bearings are chamfered next, the two dowel holes in the front end reamed by hand and the valve guides pressed into place.

The holes in the valve guides are finish reamed in a multiple-spindle drill fitted with an indexing fixture by means of which the work is indexed and the valve openings finish reamed. The valve throats must be held concentric with the valve stem hole within .006 in.

The rear end is next finish milled square with the crankline, this operation being performed in a special facing machine and the pads on the side of the block for the oil pump shaft bracket and vacuum pump are milled in an automatic machine.

The next operation is honing the cylinder bores in a six-spindle honing machine, after which comes final inspection. The honing operation removes about 0.0010 to 0.0020 in. with a tolerance of .0020 in., while the maximum amount of out-of-round and taper in any bore cannot exceed 0.0005 in.

In the final honing operation, as in the second bore and finish ream, the block is located from the crank holes rather than from the bottom surface, as is usually done, in order to make still more certain that the bores will be normal to the crank line.

THE luxury tax on the sale of motor vehicles in Hungary was revised by decrees of May 8, 11 and 16. This tax now amounts to 5 per cent ad valorem on motorcycles, with or without sidecar, and on automobiles up to 14 hp.; 10 per cent on motor boats and yachts as well as on automobiles of 14-24 hp., and 15 per cent on automobiles of more than 24 hp. Engines for the classes of vehicle mentioned above are subject to the same tax as the vehicles for which they are intended. Chassis, open or closed bodies and "combinations" are subject to a tax of 10 per cent and motorcycle sidecars to 5 per cent. Pneumatic tires for automobiles and certain other accessories for automobiles enumerated in the decree pay 10 per cent.

"Scuffing" of *Tires* is Studied as Source of Wear

New test method developed by Bureau of Standards used to
determine action on treads.

PERCY H. WALKER and E. F. Hickson of the Bureau of Standards have made a study of the movement of tire treads when in contact with a flat surface, which tends to show that a considerable part of tread wear is caused by slipping, or "scuffing" of portions of the tread on the road surface.

Two methods of observing and recording tread movements were used. One of these made use of an apparatus by which the tire could be pressed against and rolled along a heavy glass plate, through which the movements could be observed.

The second method employed is more convenient and consists in recording the movement on waxed plates; it is carried out as follows: Aluminum sheets about 8 by 10 in. and 0.010 in. thick are given a thin coating of melted paraffin wax on one side. After the paraffin has set the surface is sprinkled very sparingly with grains of No. 60 Carborundum. As a tire under load flexes when rolled over one of these plates, the carborundum grains, or at least a portion of them, stick to the tire and trace their path on the waxed plate.

Methods Used

At first the records were made by interposing the waxed plates between the tire and the heavy glass plate of the apparatus used with the first method, but it was found that equally good records could be obtained by using an ordinary drum tire testing machine and allowing the waxed plates to pass between tire and drum.

Different tires were mounted on a drum test machine and records of tread movements made under air pressures and axle loads corresponding to normal operating conditions. The tire was turned by hand at a speed corresponding to about 2 m.p.h. as the waxed plate passed between the tire and drum. From the records obtained it can be seen that the general movements in all the treads are similar. Each tread may be divided into three parts—the center, the intermediate portion, and the outer portion. In the center of the tread the movement is in an approximately straight line along the circumference in a direction opposite to that of travel. The outer portion of the treads also have circumferential movements, but in the direction of travel. In addition they move toward and away from the center line, the combined motions forming a curve. The intermediate portions move similarly, but the resultant movement may be either in the direction of travel or against it, depending largely on the distance from the center line.

Records were also taken with the tire running at considerable speeds (up to 30 m.p.h.) and transmitting more or less power. In one series each tire successively exerted tractive efforts of 0, 70 and 140 lb. As the tractive effort was increased the scratches at the center of the tread increased in length. The circumferential movements of points in the intermediate portions were

increased while those of points in the outer portions were decreased (these latter motions being normally in the direction of travel). The movement toward and away from the center was not appreciably influenced by the tractive effort (it being understood that very large tractive efforts, such as obtain during rapid acceleration or application of the brakes, were not considered in this study.)

Naturally, the greatest tread movements occur with low air pressure and high axle loads. As between high pressure and balloon tires, it was found that there was more tread movement with the latter.

The records obtained indicate that the movement of a tread may be affected by the direction of rotation, particularly in the case of non-symmetrical designs. It was noted that with some tires the tread movement was excessive at certain points, particularly at the ends or edges of non-skid buttons. The authors say that it would seem to be desirable to design the buttons so that their edges will be approximately parallel to the periphery of the area of tire contact, as in that case the whole of the surface of the button would come into contact quickly. The results obtained in the study also seem to make it desirable to change the direction of rotation of the tires in service occasionally.

The results obtained by recording the tread movements indicate that at least a considerable part of the tread wear may be caused by the slipping of portions of the tread over the road surface in changing from the normal to the deflected condition and vice versa. This might be termed a scuffing action. In actual service, of course, there are also other causes of tread wear, such as high tractive efforts which cause the tire as a whole to slip; slipping due to braking, the bouncing of tires, etc. In some cases these items may be the predominating factors in tire wear but from a general observation of tires in service it is thought that in most cases scuffing is the important or at least an important factor in producing wear. A few examples are given:

Results of Scuffing

(1) The tendency of treads to cup is more prevalent in front than in rear tires, which is in accordance with the conclusion that tractive effort tends to reduce the movement of the outer tread and to increase center movement.

(2) Wearing of the edges of the buttons is evidently a scuffing action.

(3) A microscopic examination of the surface of used tires does not usually show abrasion in any particular direction except, perhaps, on some of the edges of buttons. This is in accordance with the scuffing theory. Wear due to slip of the tire as a whole would show movement mainly in a circumferential direction.

Broad Solution for *Traffic* Problem *Developed* in New York

Regional Plan Organization, after exhaustive study of use of streets and highways, offers detailed plan for reducing or eliminating congestion.

By A. B. Crofoot

TRAFFIC congestion in and around New York City, together with its causes and possible solutions, has been the object of a deal of study on the part of the committee on the Regional Plan of New York and its Environs during the past four or five years. This committee, which is supported by voluntary contributions, cooperates closely with municipal authorities and civic organizations in New York and municipalities within fifty miles of New York. Among its projects for city planning, it has taken into consideration the congestion of traffic lanes leading into or through the city and congestion that results at certain points due to local traffic. For this purpose it has made traffic counts, ascertained sources and destinations of certain portions of the traffic, analyzed the traffic needs and facilities of the region and studied some of the suggested remedies. While most of its recommendations are very general in nature, its survey points to some very definite defects in the present system, some of which suggest their own remedial measures.

This particular area furnishes a particularly difficult problem because it is practically trisected by two bodies of water, the Hudson River and Long Island Sound. The latter particularly makes it necessary for all traffic coming from Long Island, which includes the boroughs of Brooklyn and Queens to travel over one of the five bridges or by ferry, resulting in a comparatively small group of bottle-necks. Inasmuch as the bridges all serve the congested areas of Manhattan, this direction of through traffic but serves to increase

that congestion. The Hudson is better served with ferries, and now has the Bear Mountain Bridge to the north, and the Holland Tunnel serving the congested section of Manhattan.

For the purpose of this survey, the thoroughfares are classified as arterial and circumferential routes, the arterial routes being those radial routes that pass through the business section of the city and the circumferential routes joining points outside this section. The committee analyzed the various through routes existing, and found that while New York was fairly well supplied with arterial routes it was sadly lacking in circumferential routes, there being only three clearly defined complete routes of the latter classification, while there were 11 principal routes to towns of 50,000 or more within an area of 200 miles of New York. This tends to result in traffic intended to pass from one such town to another being directed through the heart of New York City.

The arterial routes are not always planned for the best service of the area either, as is evidenced by the fact that traffic counts conducted show that from 1400 to 1600 vehicles an hour pass through the heart of Elizabeth, N. J., in this area over the Lincoln Highway. Traffic over the Albany Post Road, near the New York city line runs at much the same figure. Traffic over the Merrick Road on Long Island runs a close second at 1300 vehicles an hour with the other arterial routes running from 1035 to 1105. It is obvious that some of this traffic is local while the bulk of it is through travel. These arterial routes should



Maximum traffic density of main roads leading into New York

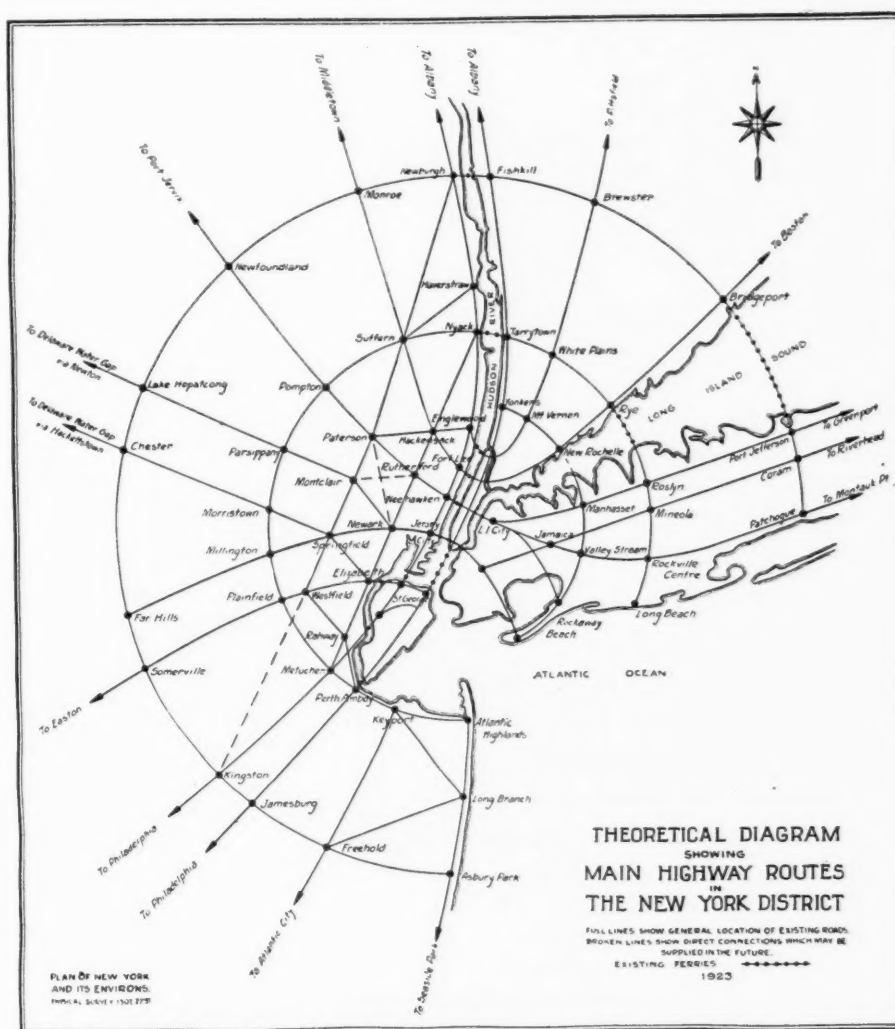
be so laid out as to avoid the heavy business sections of the communities through which they pass so that the congestion would not be quite so heavy.

The committee has drawn a map showing the theoretical layout of the two types of routes, and this clearly demonstrates the need for more circumferential routes. This map taken in conjunction with figures obtained from other surveys, also points out the places where these routes are needed. Analysis, for example, shows that of the cars entering the business section of New York—for the purposes of this survey defined as that section of Manhattan below 59th street—64.9 per cent come from the north, 27.1 from Long Island, including Brooklyn and Queens, 7.4 per cent from New Jersey, and 0.6 per cent from Staten Island.

As can be readily seen from the analysis of origins given above, the heaviest traffic occurs along the north and south avenues, and the through streets in this direction are fairly congested most of the time, while the cross streets, except in certain areas, are less crowded, and their congestion is of a more periodic nature than that occurring in the avenues. Where the cross streets are congested, however, the crowding is fully as bad as it is anywhere along the north bound avenues. The need, therefore, is for a greater number of entrances along the two water fronts, so that cross traffic can be spread out over a larger area, thus relieving some of the points of cross-town traffic, and for some sort of rerouting or redesign of traffic along the north and south avenues.

High buildings with their consequent large daytime populations, and the quantities of merchandise shipped into and out of them, are considered by the committee as one of the large contributors to congestion in certain areas and at certain times.

The committee has summarized the contributory causes to this congestion in the city and environs as follows:



The diagram shows, by smoothing out the main highways, the preponderance of radial over circumferential routes in the metropolitan area

(a) Narrow streets inherited from former times;

(b) Building heights too great for capacity of adjacent streets;

(c) The lack of zoning with reference to use, height and bulk of buildings, so as to preclude the creation of traffic congestion caused by the use of streets by such building tenants, especially at morning, noon and evening hours;

(d) The lack of platting ordinances which would prevent the creation of new subdivisions with streets which are too narrow for their ultimate use;

(e) The inadequacy of arterial thoroughfares both present and proposed;

(f) The lack of a comprehensive plan within which can be included each of several creative and preventive measures suggested above.

Principal among the remedial measures suggested is that of segregation of traffic under several different classifications and by several methods. It is pointed out that through traffic should be segregated from local traffic, for example. Passenger cars and commercial traffic should be segregated according to some plans. Horse drawn vehicles are now excluded from certain of the bridges crossing the East river, the thought behind this being that these are slower than motor vehicles and consequently delay the latter and tie traffic over these bridges up generally. The methods of segregation suggested are also numerous. The exclusion of passenger cars from certain routes, by sending them to side streets, is one of the suggestions. The establishment of elevated highways for through traffic is another suggestion that has received considerable attention from time to time. In fact this same idea has been suggested in a still more comprehensive plan of establishing three tier lanes of traffic—a subterranean tier for all trolley and rapid transit lines, a ground level for free-wheeled vehicles and an elevated level for pedestrian traffic.

The establishment of six-lane thoroughfares along the

two river fronts has been frequently suggested and has received some attention. Under this scheme, of course, there would be three lanes going in each direction, those nearest the center of the thoroughfare for fast through traffic, the intermediate lanes for commercial through traffic and the outer lanes for local traffic. The total possible traffic under such a scheme is estimated at 2500 vehicles per lane per hour, a marked increase over the present capacity.

The by-passing of through traffic around congested areas of local traffic is regarded as such a logical move as to require little comment, but the more general adoption of this plan is strongly urged. Increasing the number of through highways is also suggested, but while this is essential it is regarded as by no means a solution of the problem, as it is a well known fact that any increase in facilities of any sort almost automatically brings about such an increased use of them that little relief results. However, an increased number of circumferential routes, the creation of more parallel radial routes and diagonal routes whereby vehicles can easily gain one radial route from another one, are all steps urged by the committee.

Another important step suggested is the further elimination of parking privileges along much traveled thoroughfares. Where the whole width of the street is available for moving vehicles the capacity of that street is increased, often as high as 50 per cent. Taxicab companies should be made to provide their own stands inside of property lines, and mercantile houses should be made to handle all their loading and unloading within their own property and off the public highway. This latter step has already been taken by a number of the department stores, but there are still to be found numbers of trucks along the side of some of the busy streets, which are being loaded or unloaded. In many instances these are not only blocking a part of the street, but so clutter up the sidewalks as to force pedestrians into the street, adding still further to the confusion of traffic.

The more general adoption of building arcades for pedestrian use, thus allowing the whole width of the street for vehicular traffic is also suggested. More rigid zoning of building operations, limiting the size of buildings according to the capacity of adjoining streets is another move that is regarded as important.

The committee's summary of specific recommenda-

tions for curing or at least alleviating the traffic evils follows:

A. Arterial and Circumferential System for Entire Area

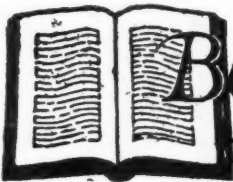
1. A by-pass route north of the congested part of Manhattan Island to connect New Jersey with the mainland of New York State east of the Hudson River.
2. A new highway inland from the existing Shore Road in Monmouth County, to provide more direct access from Northern New Jersey to the shore resorts.
3. The necessary legislation and adoption of a program to make possible the eventual development of a parkway route along the Morris Canal west of Paterson.
4. A new route to provide better connection from Bridgeport and Norwalk to the Hudson River Bear Mountain Bridge.
5. The development of a parkway system west of the Hudson River, corresponding to that being developed by Westchester County on the east, which will connect the Palisades Interstate Park with the Essex County Parkway system via the Saddle and Passaic River valleys.

B. Exits and Entrances to Metropolitan Center

1. Development of new arterial routes on the southern part of Long Island, which will help to relieve congestion on existing highways and provide connections with Brooklyn which will by-pass congested points in that Borough and the Borough of Queens.
2. An additional general traffic route parallel to the Boston Post Road between New Rochelle and Bridgeport.
3. The adoption of a program which would provide for a future parkway route from southern Westchester County to Bridgeport.
4. A circumferential route from the proposed Hell Gate Bridge, Borough of Queens, to the vicinity of Fort Hamilton, Brooklyn, by-passing congested districts. Kings Highway should form a part of this route.
5. Extension of Riverside Drive to connect with existing roads in Yonkers, with a diagonal connection to the Tibbetts Brook Parkway.

C. Borough of Manhattan

1. Removal of obstructions in north and south avenues so as to increase their present capacity.
2. Development of new routes along the Hudson and East River waterfronts for through traffic.
3. Development of a highway along the Manhattan side of the Harlem River to connect the north and south avenues and make them more available for through traffic.



Books for the Business Bookshelf

Motor Body Engineering

George J. Mercer. Ware Bros. Co., Philadelphia. 202 pp. illus. \$5.

THIS book, by one of the best known body engineers in the country, fills a long felt need for a volume which contained correct and concise information concerning the relatively new subject of motor vehicle body design. The author has had very wide and long experience in this work and as the book shows is amply qualified to discuss the trends and practices of modern designs.

In detail, the book carries through in logical order the series of steps necessary in designing a body. After a brief history of design in general there follows a chapter on the engineering practices as applied to the development of a working draft. This is followed by another chapter on the production of the working draft after which come discussions of mill work and frame

assembly; metal work; specifications; finishing; trimming; body materials; and information about collapsible roofs, auxiliary seats, etc. The book is profusely illustrated and contains, in particular, complete stock lists, drawings, wood and metal assembly and finish and trim assembly operation charts for a typical coupe body.

Influencing Men in Business

Walter Dill Scott—revised and enlarged by Delton T. Howard. The Ronald Press Co., New York. 172 pp. \$2.50.

SINCE the last edition of Dr. Scott's book was published in 1916 great progress has been made in psychological studies both in laboratory tests and in experience on the business world. The task which Dr. Howard has fulfilled satisfactorily has been to incorporate this newly developed material without losing any of the simplicity and conciseness which featured the previous edition.



Panhard & Levassor 4½-ton truck using charcoal gas, with trailer

French Fuel Demonstration Ends

Various substitutes for gasoline used successfully during 1000-mile trip of 20 trucks and buses.

AFTER having covered 1000 miles and consumed all kinds of fuel to the exclusion of imported gasoline, 20 automobile trucks and cars returned to Paris recently and their drivers and crews were welcomed on the Place de la Concorde. This is part of a general program, having the substantial backing of the government, to develop and popularize the use of national substitutes for foreign gasoline.

The event was a demonstration, without any strict technical rules, and was marked by exhibitions, lectures and meetings in the various towns of the east and north of France, and also of Belgium, through which the procession passed.

There appeared to be no failures attributable to the substitute fuels, and all the vehicles having set out from Paris returned to the capital. The greatest use was made of producer gas plants burning charcoal in its natural or in a prepared condition. This type of truck has now been perfected and is entering into general commercial use. The Panhard & Levassor Knight engine 4½-ton pneumatic tired trucks with the Panhard producer gas plant frequently maintained 35 to 40 m.p.h. on the open road and ran distances of more than 100 m. without having to fill up. A further development in this line was the use of compressed peat as fuel, which apparently gave satisfactory results, both on the trucks and on two touring cars.

There was only one Diesel engine in the trials, this being used on a Somua 25-passenger bus and being a 2-cylinder 2-cycle powerplant built by a branch of the Peugeot Co. under Junkers license. It finished all the daily runs in reasonable time, but was somewhat slow on the hills and was not altogether free from smoke.

The Paris Omnibus Co. entered two single deck 40-passenger city buses, running on pneumatic tires and

consuming methane gas compressed in steel bottles. Each bus had six bottles concealed under the body overhang, and had a radius of action of about 45 m. In place of the usual type of steel bottle used for compressed gases, it is intended later to make use of special sheet steel wire bound bottles which, while being lighter than the present type, allow of a much higher compression. These were not ready for the demonstration, although they are being put into production at a factory in France. The bus engines had a compression ratio of 5.4.

A Panhard & Levassor Knight engine truck, hauling a trailer with a compressor plant, accompanied the tour, in order to supply compressed gas to the buses, and it also ran on gas. The compression ratio of this engine was 6. As the radius of action was insufficient with the bottles used, it was the practice to make a portion of each day's run on gas and to finish on benzol. The drivers maintained that they had a greater degree of flexibility with methane gas than with the liquid fuel.

The city of Paris is considering the use of compressed gas for its bus service, but in the meantime the city of Metz has adopted this fuel, with, it is claimed, a saving of 50 per cent in fuel costs. The degree of economy compared with gasoline is determined largely by the price of illuminating gas, but generally is between 30 and 50 per cent.

Benzol was used satisfactorily on several trucks, but as this fuel costs 20 per cent more than gasoline, it has no commercial advantages. Alcohol, either alone or with mixtures of gasoline and benzol, was used on half a dozen vehicles, but here again cost is at present higher than gasoline. Synthetic wood alcohol is now being produced and, it is said, will be marketed at a price to compete with imported gasoline.

Voran *Front-Wheel Drive* Employed in New German Buses

Arrangement unusual in that entire powerplant is located forward of front axle. Two sets of transverse springs are used.

By Edwin P. A. Heinze

RECENTLY the first of a number of front-driven buses ordered by the Berlin General Omnibus Co. was placed in service by that organization. The bus, which has seats for 51 and standing room for nine passengers, incorporates the front drive of the Voran Co., which was described in the 1927 Engineering Number of *Automotive Industries*. It was designed by Herr Bussien, a front-drive specialist, in collaboration with Herr Garsstka, chief engineer of the bus company. The total length is 29½ ft., but since the front axle is set back 86 in. from the front edge of the radiator and there is an equal overhang at the rear, the wheelbase is only 181 in. The tread is the same at front and rear, viz., 78 in. When the bus is under load, the height from the ground to the top of the frame is 22.8 in., while the minimum ground clearance is 7.8 in.

The arrangement of the front drive differs from the usual one on front-driven passenger cars in that the entire powerplant is located forward of the front axle, with the transmission and worm gear drive back of the engine. A considerable forward overhang of the powerplant is common in German bus practice, the advantage of this arrangement being a better division of the load between the two axles.

A six-cylinder Maybach engine of 3.7 in. bore and 6.61 in. stroke, developing 105 hp. at 2200 r.p.m., is employed. With water and oil it weighs approximately 970 lb. A stock 3-speed gearbox of the Zahnradfabrik Friedrichshafen is blocked to the en-

gine. It has forward speed ratios of 1:3.6, 1:1.86 and 1:1, and a reverse gear ratio of 1:4.72. The clutch is a Borg & Beck, while the final drive is by a David Brown & Sons worm gear with a ratio of 1:7.25. The Voran drive retains its original features, having three universal joints in each driving shaft, but metal joints are now used instead of the fabric type.



Details of Voran front drive

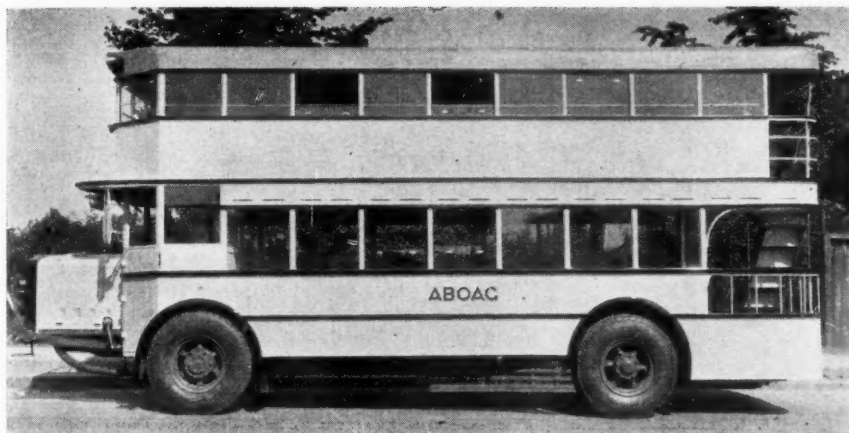
Two sets of transverse springs (quarter-elliptic on top and a semi-elliptic below) take the place of a solid front axle. Radius rods extending from the steering knuckles rearwards to the frame, to which they connect by ball and socket joints, transmit the tractive force.

The propeller shaft projects from the rear of the differential housing and carries a brake drum on which the service brake acts. The hand

brake acts on the rear wheels. A special feature of the braking system is that both brakes may be adjusted from the driver's seat—if need be while driving. Engine, clutch, gearbox and final drive, together with the front wheels, form a single unit that can be removed from the bus and exchanged for a spare unit in very short time.

Single Wheels Used

Noteworthy also is the fact that only single wheels of the cast steel spoked type (Fischer) are employed, which are fitted with 44 by 12 in. pneumatic tires. The weights of the various units and of the whole bus are as follows:



Exterior view of front-drive German bus. Although total length is 29½ ft., overhang at the rear and setback of front axle holds the wheelbase to 181 in.

Engine	970 lb.
Gear box and clutch assembly	353 lb.
Differential assembly	770 lb.
Chassis, complete	7,055 lb.
Body	5,290 lb.
Bus, complete, but empty	12,345 lb.
Bus, laden	20,500 lb.

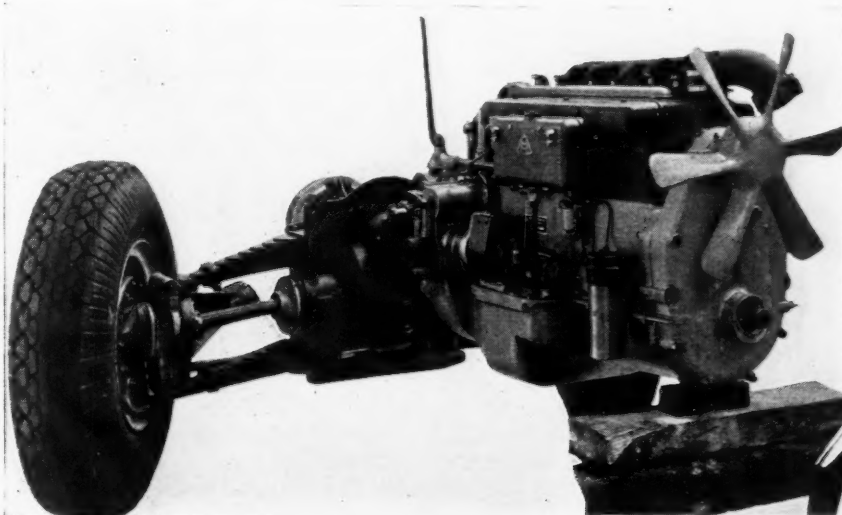
Of this total the driving axle carries 9590 lb. and the rear trailing axle, 10,910 lb.

The Voran Co., under whose patents the front drive is being built, has succeeded in letting licenses to a number of manufacturers: The Swiss Elektrische Fahrzeug A. G. (Electric Vehicle Co.), builds gasoline vehicles, has secured license rights for four different models. The Phaenomen Co., which supplies cars to the German Post Office, has also become a licensee, as have Vomag, a well-known manufacturer of trucks and buses, and Selve, all three German firms. Negotiations with a large British combine are said to be under way.

The experience gained with the first bus exceeded expectations, and the drivers of the vehicle—a new one is being told off for duty on the bus every day—affirm they have

never steered a vehicle that is so well under control on greasy roads. Freedom from skidding tendencies is a characteristic inherent in the

front-wheel drive principle, which also is claimed to have superior hill-climbing qualities. The Selve company has a six-wheeler under development, in which every one of the six wheels will be driven and independently sprung, the Voran drive being adopted. This car, which is meant for service in undeveloped country, will probably be ready by the next Berlin automobile show to be held Nov. 8-18.



Engine view of Berlin front-driven bus

A NEW era in long-distance passenger transport by road was commenced in England at the middle of August by the starting of two night services with sleeping accommodation for all passengers to and from London and Liverpool and Newcastle respectively, the former city being approximately 200 miles from the Metropolis and the latter 280 miles. The two services are entirely independent and are operated by different makes of chassis and different arrangements in the bodywork.

The London-Liverpool service is run with Daimler chassis having six-cylinder Knight sleeve valve engines. The buses start from their terminal points at 11 p. m. and are timed to arrive at their destinations at 8 a. m., inferring an average speed of 22 m.p.h. and the maintenance of 27-30 m.p.h. on open roads. Faster speeds could be arranged, but it is considered that there would be no advantage in either starting later or arriving earlier.

This service does not run on Saturday nights, so that the week-ends are left free for inspection, overhaul and repairs. The fare is 25 shillings each way,

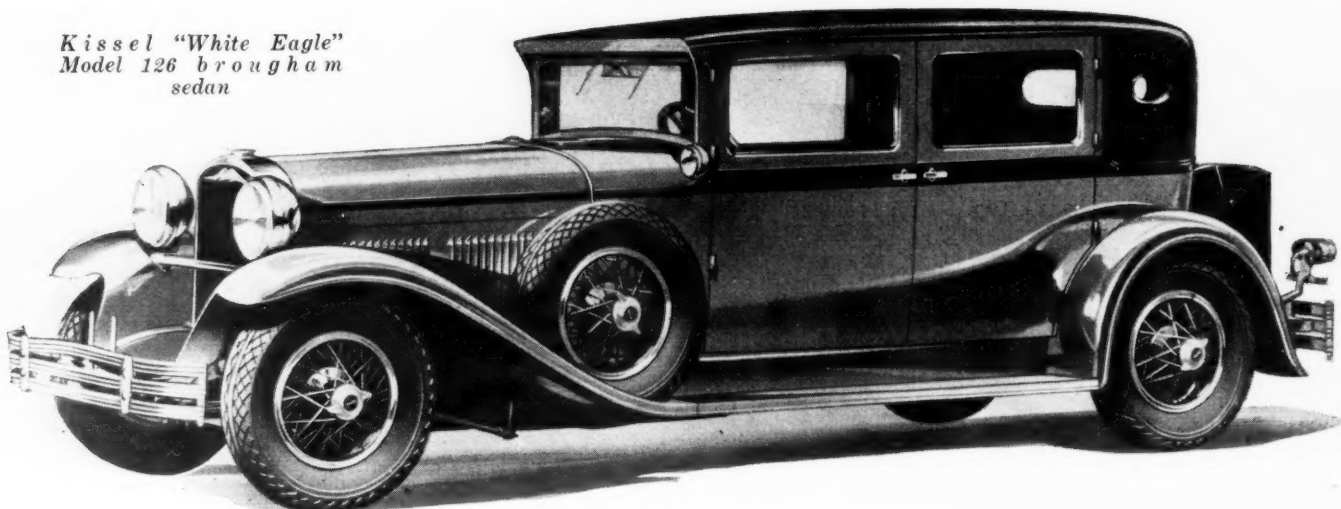
which is approximately the same as the third-class railroad fare without sleeping accommodation; passengers secure what corresponds with first-class accommodation, together with morning tea and biscuits served from the buffet on board, which provides all kinds of non-alcoholic refreshments.

Each bunk is curtained, has its own electric light and switch and a sliding window controllable by the occupant.

The London-Newcastle sleeper buses are on six-cylinder Guy chassis and like the others are four-wheelers with bodies accommodating 12 passengers each. In this case, however, there is one compartment for the 12 bunks, six in two tiers on either side, each bunk being 6 ft. long and 2 ft. wide. At the rear end is a buffet and a lavatory and also 12 seats. Protected baggage space occurs on the roof.

Arrangements for a spare driver, individual lighting of the bunks and other details resemble those of the London-Liverpool service, while in this case enhanced dependability of the service is aimed at by the carrying of two magnetos and two spare tires.

Kissel "White Eagle"
Model 126 brougham
sedan



Kissel Announces New Line With Conventional *Radiator* Design

Appearance of cars greatly changed. Three models, including two straight eights, offered. Compression is higher. Hydraulic brakes fitted. 21 body styles.

By M. Warren Baker

RADICAL changes in outward appearance are combined with refinements in chassis and additional power and speed in the three new 1929 White Eagle Kissel series. Two straight eights and a six will constitute the line.

Twenty-one body styles are included in the three new series, as compared with 34 body styles in the seven classifications formerly used. The large eight, known as the Model 126, is ready for the market in two wheelbases, 132 and 139 in., while the light eight, known as the Model 95, will be built only on 125 in. The six series, known as the Model 73, has the same wheelbase as its predecessor, 117 in.

The feature of the new cars that attracts most attention is the vastly different appearance from anything heretofore built by Kissel. The rounding radiator has been replaced with a radiator of distinctly foreign motif, having a very narrow rim in front, but appearing wide and massive from the side. The radiator is high and narrow with large capacity.

Another departure from usual Kissel design is the use of a full fender, eliminating the individual front fenders which have featured Kissel products for more than 15 years. The new fenders are full crowned and carry out the sweeping lines of the entire car's design.

The Kissel medallion, which formerly was mounted on the radiator, has been replaced by a large white eagle, the wings of which are spread almost the full width of the radiator.

Mechanically, the changes largely are a matter of refinement. Compression has been changed by the use of a redesigned high compression cylinder head from 5.15 to 5.35 in the Model 126, thus raising the horsepower from 115 to 126. Bore and stroke is the

same as the former White Eagle speedster engine, $3\frac{1}{4} \times 4\frac{1}{2}$ in., giving the same piston displacement and S.A.E. horsepower rating.

Specially designed Bohnalite pistons also are a factor in the higher compression, while the connecting rods are of the same drop-forged Lynite construction as formerly. Bearing dimensions are unchanged and other engine details, including Silchrome exhaust valves, are the same as in the White Eagle speedster.

The Model 95 chassis has many of the same characteristics as the preceding Model 80 and 80-S. Bore and stroke remain the same. However, the use of a high compression cylinder head of new Kissel design, and Lynite, Invar-strutted pistons, has raised the compression to the same ratio as in the Model 126 and has increased the actual horsepower from 70 at 2900 r.p.m. to 95.

Dual Manifold

A dual down-draft manifold has been installed in connection with a $1\frac{1}{4}$ -in. duplex Schebler carburetor on the new 95, replacing the single manifold which formerly was standard equipment on all models except the White Eagle speedster.

Silchrome exhaust valves also have been added in the Model 95, while the connecting rods, as in the Model 126, are Lynite drop-forged I-sections.

Mechanical changes in the six engine are limited principally to the use of new Lynite pistons with Invar inserts and the use of drop-forged Lynite I-sections for the connecting rods. Horsepower has been increased from 70 to 73 by the use of lighter reciprocating parts. Silchrome steel exhaust valves also now are standard equipment on the six-cylinder model.

Frames on all three cars are lower than in the preceding models, having a still more pronounced kick-up at each end. Road clearance, however, is maintained the same as formerly. On all three models the frames are braced by tubular cross members and the side rails are constructed of heavy 25 point carbon steel channels.

Lockheed hydraulic internal expanding four-wheel brakes are used on the new models. Brake drums on the Model 126 are 16 in. in diameter and have a face of $1\frac{3}{4}$ in. On the Model 95 the brake drum width is the same but the diameter is 14 in. The parking brake, as formerly, is mounted on the propeller shaft behind the transmission.

Springs have been increased in length and width on the two eight models, and embody the same rubber cushion mounting at each end. On the Model 126, rear springs are 60 in. long and $2\frac{1}{4}$ in. wide. Springs are semi-elliptic type on all models. Front and rear springs on the Model 95 are 38 and 57 in. long by 2 in. wide respectively.

The cooling system has been improved by Kissel engineers by increasing the water capacity to five gallons, the use of a vertical tube radiator, and extending the water jackets around the spark plugs. The Kissel thermostatic water control is fitted into the cylinder head on the new models.

Body Styles are New

Body styles on the new White Eagle models show as great a variance from preceding cars as do the radiator and fenders. A wide panel is carried around the bodies and down the full length of the hood to the radiator, making it possible to carry out two-toned lacquer effects to the best advantage.

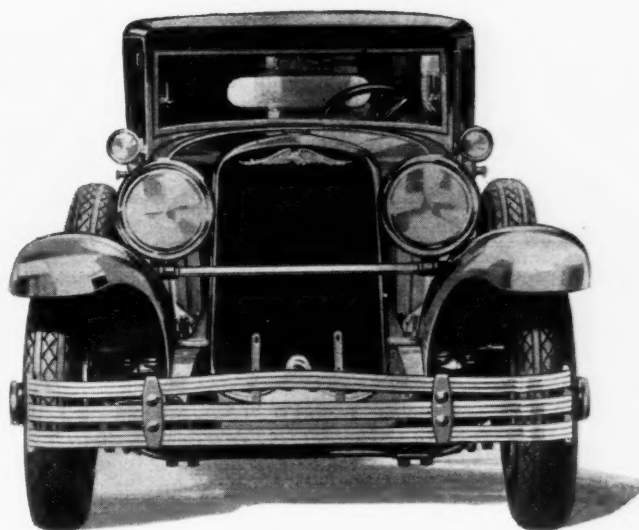
The front portion of the body roof has a pronounced slope to make possible the elimination of a sun visor without affecting vision or causing glare. Another feature that becomes immediately noticeable is the long oval rear window which replaces the square window formerly used. The oval blends with the other rounding curves of the body design. Beveled plate glass side windows also are used in the rear quarters of the 126 brougham.

Interiors of the new cars have been finished with a lavish hand. Solid walnut window moldings are used and the solid walnut door strips are inlaid with patterns of contrasting colors. The instrument board panel also is of solid walnut, hand fitted and hand polished. Arm straps, arm rests, vanity cases and cigar lighters are additional features of the Model 126 and the de luxe Models 95 and 73.

Seats are of a special form-fitting construction introduced by Kissel several years ago. Cushions are deep and comfortable and the upholstery is of Chase mohair in all closed models except the de luxe styles, which are upholstered in silk plush. Pullman lights are supplied, operating when the rear doors are opened, and silver finish hardware is used throughout all three series.

Tire wells for side mounting are constructed of cast aluminum with a highly polished rim. Aluminum instead of metal stampings are used to eliminate rust, according to Kissel engineers. On the de luxe brougham models a steamer trunk and rack are standard equipment.

Ilco-Ryan headlamps of a new design and side lamps of the drum type are supplied. All bright work, including lamps, bumpers, radiator shell, door handles, cowl bead, hub caps and rear traffic signal, formerly nicked, now is chromium plated.



Front view of new Kissel

Model 126 will comprise eight body styles, a four-door brougham-sedan, all-year coupe-roadster with collapsible top, coupe roadster, all-year brougham, seven-passenger sedan, Berline sedan, speedster and tourster.

These will all be equipped with the following as standard: Lovejoy shock absorbers, front and rear bumpers, electric clock, double electric windshield wiper, combination cigar lighter, ash tray and trouble light, double rear view mirror, combination stop and reverse light, engine heat indicator, six wire wheels, two mounted in front fender wells, trunk with suit cases on brougham, seven-passenger sedan, Berline and tourster, folding trunk rack on seven-passenger and Berline sedans, vanity cases in sedan models, heater, kick plates, toggle straps, curtains on windows of all closed models.

The tourster, speedster, all-year coupe and all-year brougham are regularly upholstered in Spanish leather and all other models in Chase silk mohair unless otherwise specified. Spanish leather, mohair, or broadcloth, however, are optional for all models without extra cost. Colors are optional in a variety of shades and combinations. Tires on the 126 models are 30 x 6.75.

Equipment is Complete

Model 95 will include nine body styles, a four-door brougham sedan, a sedan, all-year coupe roadster, coupe-roadster with solid top, all-year brougham, seven-passenger sedan, seven-passenger touring, speedster and tourster. The following equipment is standard in the Model 95: Lovejoy shock absorbers, front and rear, bumpers front and rear, electric clock, vacuum windshield wiper, double rear vision mirror, combination stop and reverse light, engine heat indicator, vanity cases and toggle straps in sedan models, trunk on the brougham sedan, all-year brougham and tourster, curtains on the rear quarter windows of sedan models, and cigar lighter. Tires on the Model 95 are 30 x 6.00.

Model 73 will be supplied in four body styles, a four-door brougham sedan, a sedan, all-year coupe-roadster and a coupe-roadster with solid top. The same complete equipment with the exception of spare tires is included as standard. Tires on this model are also 30 x 6.00.

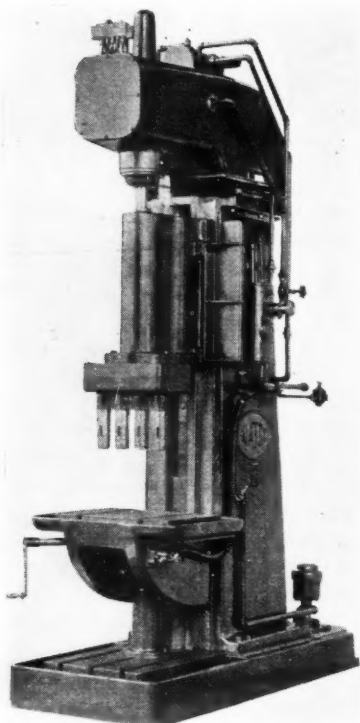
Prices are to be announced soon.

NEW DEVELOPMENTS—Automotive

Natco Drilling Machine

THE National Automatic Tool Co., Richmond, Ind., has brought out a new hydraulic, single spindle drilling and boring machine, designated Model B-250-H, which has been designed to meet the demand for a machine of this type to which drill heads can be easily and quickly attached.

A heavy flange on the lower side of the sliding head provides a rigid support and makes unnecessary the



New Natco hydraulic single spindle drilling machine

use of guide rods to support and guide heavy multiple spindle heads.

The machine has semi-automatic feed and passes through all operations from rapid traverse down into drilling position to rapid traverse up again and stop after the operator pulls the air valve. Feed rate is controlled by a valve.

The spindle rotates on heavy ball bearings and it as well as the sliding head is counterbalanced. The capacity of the machine is 1 to 2½ in. drill in steel or its equivalent in a larger number of smaller drills.

Any feed from 0 to 15 in. per min. can be obtained while the rapid traverse is 70 in. per min.

"Filor" Grinding Machine

THROUGH their American agents, the R. Y. Ferner Co., Washington, D. C., the Societe Genevoise d'Instruments de Physique of Geneva, Switzerland, is marketing a new high precision thread-grinding machine designated as the Filor. This machine is essentially one for the production grinding of thread gages, taps, hardened worms, micrometer screws and similar parts for which the highest possible accuracy

of pitch, diameter and thread profile is required.

The machine is built very strong and rigid so that it produces a fine finish which makes lapping unnecessary. It is fully automatic and the feed of the grinding wheel can be stopped at any desired point so that a series of pieces may be produced within a few ten thousandths of an inch of duplicate size without measurement.

Grinding on both return stroke as well as forward stroke has been obtained by replacing the usual lead screw with change wheels on a quadrant by interchangeable master screws rigidly fixed at the extremities of the main spindle.

The main spindle is driven alternately by an oscillating shaft with universal joints. The work table is pulled toward the left by a counterweight applied through a master screw to eliminate play in the nut. By this means the workpiece is held rigid with the master screw and executes a true helical motion corresponding to that of the master screw, and the grinding wheel, which is fixed in the axial direction, cuts a correct geometrical helix.

The nut of the master screw has a fine setting motion operated by a handwheel, one revolution of which moves the nut 0.01 in. The grinding wheel employed is 17¾ in. diameter and the slide which carries it is constantly pulled toward the workpiece by a counterweight and thrusts only against the nut of the feed screw. The feed screw of the wheel is operated automatically at one of the dead points of table travel by a pawl device. This device can also be controlled by hand without interrupting the automatic feed. It can be adjusted to any feed between .002 and .0002 in.

Normal speed of the wheel spindle is 1360 r.p.m. which gives surface speeds of from 92 to 99 ft. per sec. A planetary gearing is provided to decrease this speed for rough dressing of the wheel. Two driving belts are used to equalize the pull on the two-inch bronze bearing used.



Societe Genevoise "Filor," high precision thread grinding machine

Parts, Accessories and Production Tools

The wheel is trued by a single diamond arranged to dress both flanks and to generate the profile necessary for various threads. The radius of the rounding is measured by a micrometer screw with a reading drum. The positions of the diamond holding crank are determined by adjustable stops and the angle of the wheel is read to two minutes accuracy on a large drum.

A micrometer stop concentric with the feed screw of the grinding wheel limits its feed so that the same diameter for all pieces of a series is obtained automatically. A single operator can operate several machines to obtain constancy of diameters from .00012 to .00016 in. The micrometer stop can be adjusted by a hand wheel graduated to .00005 in.

Reversal of the work spindle is accomplished by a double friction clutch operated by oil pressure. A change gear box controls the main spindle through an oscillating shaft. Four speeds are provided ranging from 9 to 46 r.p.m. suitable for roughing threads between $\frac{1}{4}$ and 3 in. diameter. A polishing speed still lower is also provided.

All controls are placed at the front of the machine where they are readily accessible to the operator. A swivelling microscope is mounted on the tailstock and is fitted with an electric illuminating device for thread profile examination.

The dimensions of the machine are 5 ft. 11 in., by 5 ft. 6 in., by 4 ft. 11 in. high and its net weight is 5324 lb. Six master screws of the purchaser's choice from among regular pitches are regularly provided with other screws, including metric pitches, available.

Brown & Sharpe Millers

BROWN & SHARPE MFG. CO., Providence, R. I., has just added two smaller models to its line of Standard milling machines. The new models are known as Nos. 1A and 1B and both are, in general, similar to other members of the line.

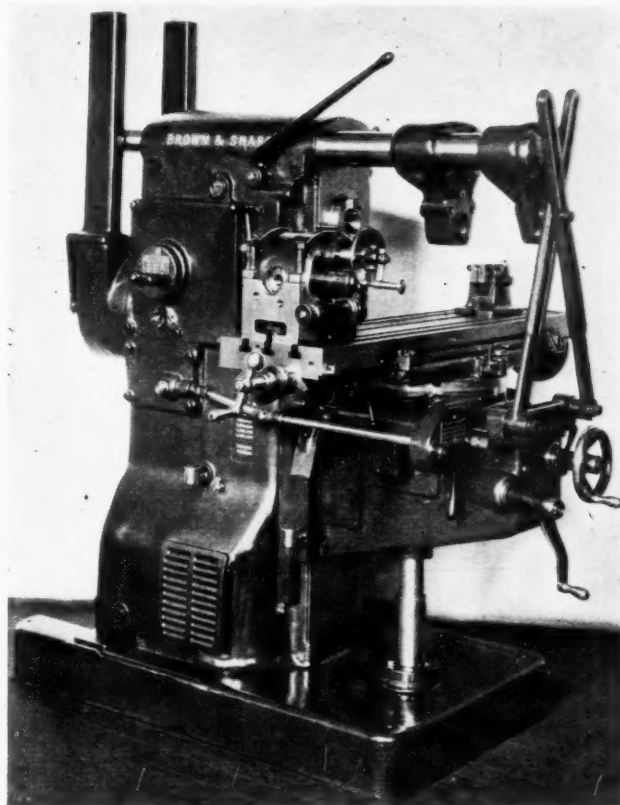
They are slightly smaller in capacity and are not equipped with power feed fast travel, dual control for feed changes nor pump, although the first and last of these can be furnished as extra equipment.

The new machines are of the motor-in-the-base type, double overarm construction and are provided with automatic longitudinal and transverse table feed. Vertical table feed is by hand. They are of the sliding gear type and a single lever operates feed changes. Speed changes in two series are also obtained through operation of a single lever, direct reading dials indicating in both cases the feed and speed for which the machine is set.

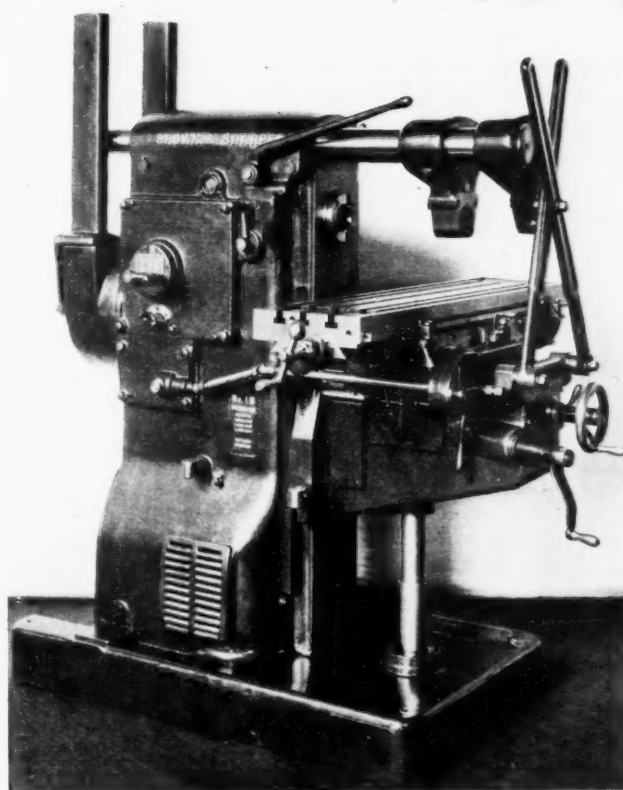
Automatic lubrication throughout is provided which forces filtered oil to mechanism in the column and to the driving pulley. The knee mechanism is also force lubricated by means of another pump.

Magnetic Oil Filter

TWO types of magnetic oil filter for gearsets have been put on the market in England by Simms Motor Units, Gresse Street, London,



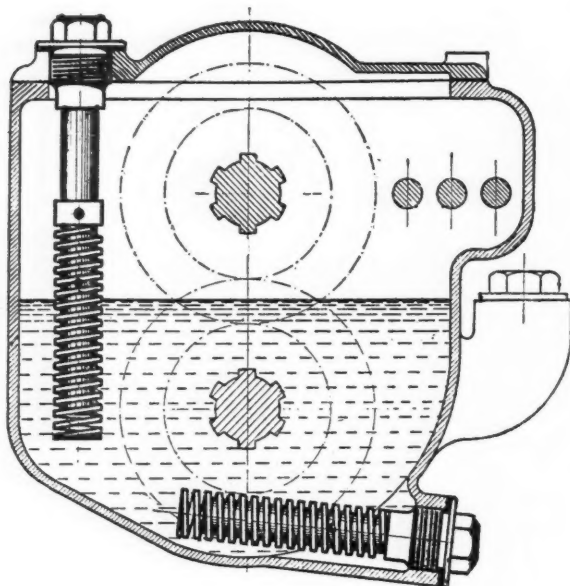
B. & S. No. 1-A standard universal milling machine



B. & S. No. 1-B standard plain milling machine

W. 1. The scheme was originally devised for engines, but that it has a greater usefulness for gearsets has been demonstrated by tests in service.

The two types are known respectively as the Long Reach and Short Reach; the first, 8 in. long, is intend-



The two types of Simms magnetic filter applied to a gearset

ed to be fitted vertically from a plug screwed into the cover of the gearset, while the second, 5 $\frac{5}{8}$ in. long, is chiefly intended for fitting horizontally to the lowest part of the box, where its fixture forms a drain plug.

The device consists of a magnet formed of a bar of chrome-cobalt steel mounted in a screwed plug; surrounding and fitting closely to the magnet bar is a sleeve consisting of a helix of square section mild steel secured by means of a pin through the magnet and a locking notch at one point of the helix. This sleeve offers a number of edges from which the lines of force of the magnet are more effectively distributed and affords a large collecting surface with a powerful attraction; it also provides a series of grooves which satisfactorily harbor the ferrous particles collected and prevent them from being swept away by the oil.

The filter can be removed in a few seconds for cleaning, which involves unscrewing the helical sleeve over the pin; the sleeve, being of mild steel, retains but little magnetism when removed from the magnet, so that the collected material can be washed off easily. Unscrewing the sleeve automatically cleans the magnet itself. The latter, it is claimed, will retain an effective degree of magnetism for 30 or 40 years.

A test recently completed of this device showed that, after it had been in use for 3 $\frac{1}{2}$ days in the gearset of a 1 $\frac{1}{2}$ -ton truck that had run with unchanged oil for a considerable time, it was thickly fringed with metallic particles which had been withdrawn from the lubricant.

Engine Heat Indicator

THE P-2 indicator, developed by Charles Engelhard, Inc., is designed to permit accurate reading of engine temperatures during road tests. The device can be attached to any part of the engine and as many as six thermocouples may be connected with one indicator. The device works on the resistance-thermometer principle and readings are in degrees Fahrenheit. The galvanometer is suspended by rugged filaments which makes it unnecessary to have the indicator level and makes it active to the most minute forces generated by the thermocouples.

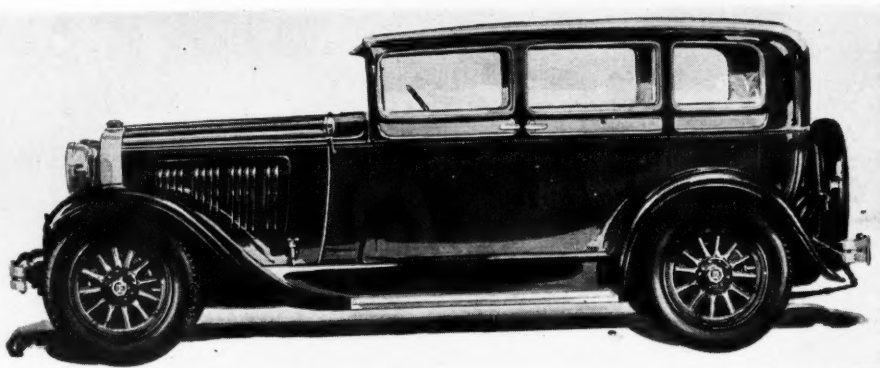
A NEW solder designed for automobile radiators which retains its strength at low temperatures has been developed by the American Machine & Foundry Co., Brooklyn. The new solder is composed almost entirely of lead and is said to suffer no loss of strength when subjected to prolonged exposure to extreme cold. It has somewhat higher melting point than ordinary tin-lead solders, but rather than being a disadvantage this is said to give a stronger joint than is possible with usual solders.

Dodge Victory Six Bodies Are Improved

ALTHOUGH no official announcement has heretofore been made, several changes were incorporated a short time ago on the Victory Six bodies by the Dodge Brothers Division of the Chrysler Corp. These involve the provision of additional leg and head room and improved body molding treatment.

The bodies themselves are from 2 to 4 in. longer than formerly, this change having been effected without changing the wheelbase. At the same time the roof has been raised an average of 2 in. in the four-door sedan and 1 $\frac{1}{2}$ in. in the brougham and other models. Cushions and seat backs are also said to be deeper than formerly for increased comfort. Sedan doors are approximately 3 in. wider than formerly. With these changes vision has been improved by a considerable increase in glass area.

Exterior finish has been improved by the adoption of a distinctive wide belt stripe along the body and door panels, terminating in a slight upward curve at the front and rear. A double pin-striping was formerly used.



New Dodge Victory Six body

Straight-from-the-Shoulder Selling Makes Best Impression

Current buying practices of factories frequently result in severe criticism of purchasing agents, but in a large portion of cases it's sales method that's wrong.

By John C. Gourlie

IN these days of close buying and selling in the automotive industry, business practices, if not held in check by strong hands, tend to acquire the atmosphere of a Levantine bazaar, where misrepresentation and haggling precede the closing of sales and displace the firm and dignified merchandising of sound products for fair prices that is generally the American rule.

There is no need to attempt to apportion the responsibility for this state of affairs. There is plenty of evidence that both buyers and sellers are at fault, and that each instance of unsatisfactory dealing has to be examined on its merits.

There is, however, good reason for saying a word on behalf of the automotive buyer, and particularly his representative, the purchasing agent. Upon buyers in the industry has most of the anathema been heaped and the purchasing agent is placed where he cannot fail to feel the full force of the angry criticism of current buying practices.

Doesn't Shape the Policies

The purchasing agent himself, of course, is only the instrument of the company he serves. If his company is committed to equitable relations with suppliers, he must necessarily be also, or he cannot hold his job. He may influence his company's policies but in the last analysis he does not establish them, save, perhaps, in minor details.

Now a purchasing agent representing a reputable company with good business principles cannot afford to be influenced very much by the type of salesman who is chosen for his affability and his winning manner of presenting gratuities and saturated entertainments to the buyer. Such a salesman is wasting his company's money and the time of the buyer, because if the product and the price are not right he will not get the business. As between products of identical quality and price "friendship" might tip the balance, but such instances are in the minority.

On the other hand there is the type of salesman who thoroughly knows his product and the problems of the buyer; who is prepared to talk costs and terms on a business-like basis without a time-wasting discussion of inconsequential matters. This manner of selling will go farther with the newer and better type of purchasing agent and particularly with the purchasing committees that rule in the big factories.

Some of these observations are inspired by W. B. Calkins, general purchasing agent, Willys-Overland Co., who recently read a paper before the Pressed Metal Institute. Speaking to men largely interested in selling to the automotive industry, he observed:

"From an advertising standpoint, your salesmen should give as interesting an outline of your affairs and

the advantages of your service as is possible, because in reality your salesmen are placing an application for employment in a much greater sense than for a personal position, as it is a collective application for your entire organization.

"May I ask the question, How would you feel if you were selecting an employee and he came into your office with some unnecessary gratuity and then said, 'How's the chances of my getting the job?' Would you be impressed by his ability as a suitable employee? Don't overlook the fact that the seasoned buyer is not influenced in such a manner."

Mr. Calkin's paper was an exposition of the new principles of scientific buying, the sort of buying that is more and more becoming the practice of successful companies, and the sort of buying that has to be met with scientific selling and consistent prices and policies. Along these lines J. D. Ceader, General Electric Co., writes to *Automotive Industries* as follows:

"The coordination of manufacturing, engineering and commercial opinion seems essential in making important purchases. It is hardly practicable to have committee consideration of everything to be bought, but major items of factory equipment or parts should receive this attention. The purchasing agent then acts in the capacity of secretary to the group, and contacts with the seller in carrying out its decisions.

"Generally, the commercial viewpoint is amply represented by the engineer who must necessarily be in frequent contact with the selling end of the business. In fact, the sales department is interested only in the results obtained, that is, in the quality of the product and the price at which it must be sold to yield the expected profit. So much for buying.

Only Two Effective Weapons

"Dependable quality and a consistent sales policy appear to me to be the most effective weapons against Price Selling. It may be discouraging at times to see the success of less stable tactics but certainly no salesman will deny the value of a sound business reputation when presenting his card to the prospective buyer."

Especially would it appear that the time-worn dodges of salesmen are transparent to the buyers operating scientifically, with as full a knowledge of costs as the seller, and possibly with better knowledge. "Asking prices" are inevitably pruned down. Speaking evidently wholeheartedly from experience, Mr. Calkins remarked further of the salesman of the old school as follows:

"We shall assume that the salesman has now reached the place where he is ready to try closing the business. He undoubtedly will make very strong claims that the prices quoted are the lowest that can be offered with any profit at all; that it is extremely

necessary that he personally secure the business, and that if any other concern quotes lower prices, they cannot successfully continue, or that they will be unable to furnish satisfactory deliveries and a suitable quality. The salesman will finally end up by wanting to know 'as a special favor' what price he must quote. This information, if the buyer should consent to give it, would certainly not increase the other bidder's confidence in the fair play of American business. From experience, we find that the buyer cannot help becoming somewhat inclined habitually to overlook or discredit such statements."

Some Fields Too Crowded

There are, of course, products so standardized and in which the field is so crowded that more courageous sales policies seem to be unavailing against the price-cutters. Mr. Calkins does not specifically mention this point, but he does urge the great need for internal manufacturing economies by the producing suppliers and he urged the parts makers not to concentrate on a single line or a very small number of customers.

In reply to a question at the Pressed Metal Institute meeting regarding his attitude toward firms which have a diversified line of products or service, Mr. Calkins said he had often made reports favorable to this type of organization as a source, because their other work tends to keep their organization intact; because they should have a broader viewpoint and more efficient methods from their contact in other lines, and finally because they should be less dependent upon his organization for their economic well-being.

The discussions brought out many points where buyers and suppliers often fail to meet on a ground of common understanding. One of the members mentioned that firms sometimes get requests for quotations on articles they are not prepared to make at the time. The usual procedure is not to withhold a bid, but rather to enter one so high that the order will not be obtained.

Mr. Calkins decried the latter practice, saying that the experienced buyer can nearly always spot the quotations which are made to keep the firm bidding from getting the business. He said the supplier had nothing to fear from not bidding, especially if he made a frank statement to the buyer at the time of just what he was prepared to do and why he could not handle the particular business then under consideration.

Mr. Calkins admitted that buyers frequently ask for too large a number of bids and said that this wasted time on both sides of the transactions. Yet, he held, there was danger of buyer and supplier getting into a rut and stressed the buyer's need of always being on the watch for new developments fa-

vorable to his business. The same held true of cases where the buyer sent out an inquiry on parts on which, as was generally known, there were sets of dies already made and operating. The question was raised whether such an inquiry meant the buyer was testing his present prices or really wanted a new source.

The answer was that his organization did not send out requests for quotations as a check—it was their business to know costs and proper prices. He added a case to illustrate a frequent situation:

"We were getting certain parts which were not entirely satisfactory, but it seemed that we had the best source. Finally we told the supplier without suggestion from him that we would allow him more money for that part provided it met certain of our requirements. They were met but we felt that another and additional source would be a wise precaution. On the answer to the request for bids another supplier came back with fresh ideas, after studying our problem. The net result was that we secured a price the same as the old price which included the tools for a certain definite number and after that we saved the tool expense which had been included in the quotation."

The Policy of What to Buy

On the question of what policy determines whether or not a car maker will produce some of his own parts and buy some, Mr. Calkins said:

"That is tied up in the policy of the various companies and their development. At the start some builders felt that they would concentrate on the big things and let out what seemed to them the less important. It is a matter of cost with additional thought that a manufacturer naturally will not stop making parts in his own plant unless the inducement is great enough to have him scrap his equipment. At the present time there are many outside plants with modern machinery which should be able to produce certain parts for less than we do; but they don't always do it—at least their quotations don't show that they can. And we must not overlook the advantages of actually controlling at least a portion of our requirements."

Frank expressions, such as those of Mr. Calkins, ought to go far toward relieving the tension between automotive buyers and sellers that exists today. Mutual understanding is what is needed, because, as Mr. Calkins says, "it is so easy to blame the other fellow. There is too self-satisfied a feeling, and I realize that I include many buyers when I say that."

"Realize, too, that, as I have already stated, often we have our own conditions to meet. Often a certain part will be used provided it can be secured for a certain price; not that we want a lower price, or



In reality your salesmen are placing an application for employment in a much greater sense than for a personal position, as it is a collective application for your entire organization

have set a certain cut on that part, but because that part may be competing with some other material or method. It is necessary for us to decide between the two and here you have the competition between materials and methods. If you could understand our side of the question, you would realize that while this might seem like setting prices for you, it is far from that. We have our own competition in materials and methods and are simply passing on to you your share of that competition."

Support for the contention that a more thorough recognition of mutual problems would eliminate many of the difficulties in buying and selling comes from another source, in a letter to *Automotive Industries* from a man whose business interests lie with the suppliers.

Courage All That's Needed

"I know," he writes, "that some of the firms and individuals about whom there have been many complaints are on a friendly basis and on a good business basis with other firms. For example, I have heard someone say, 'Well, that policy is all right, but you can't follow it with—,' and immediately two or more men would speak up and say, 'We have been dealing with them on that basis for a good many years.'"

"This proves to me that a great deal of the present trouble is due to a lack of sales courage on the part

of the supplier; in fact, I would almost say that all the trouble rests there for the reason that the supplier has worked himself into a position of being dependent on a few buyers or one industrial line. This happens so frequently and in so many different lines of manufacture that I know that it must be characteristic of the whole field.

"In this connection you may have noted the trend of many large and small organizations toward getting into lines other than that of the automotive field. One reason for this is the fact that many of the automotive buyers are exploiting with the result that they are drying up their sources of supply or driving them into other lines of manufacture. The other firms which I know are holding their own are the ones which know their costs and have a definite, well-defined, consistent, courageous sales policy, and the strange thing of it is that these firms are the ones from whom I hear very little complaint of purchasing methods.

"It looks as if in many cases the suppliers insisted on playing poker and now that they find the buyers are better players than they are, want to quit the game but cannot."

An apt comparison, and it is a pleasure to note that apparently there is less poker playing going on in the industry. Gambling is all against the spirit of big business today.

Latest du Pont Model is Straight Eight

A NEW straight 8 offered in 11 body styles is the latest addition to the line of cars produced by du Pont Motors, Inc., of Wilmington, Del. The car is powered with a Continental L-head engine of 322 cu. in. displacement. The bore is $3\frac{3}{8}$ in. and the stroke $4\frac{1}{2}$ in. The horsepower rating is 36.45.

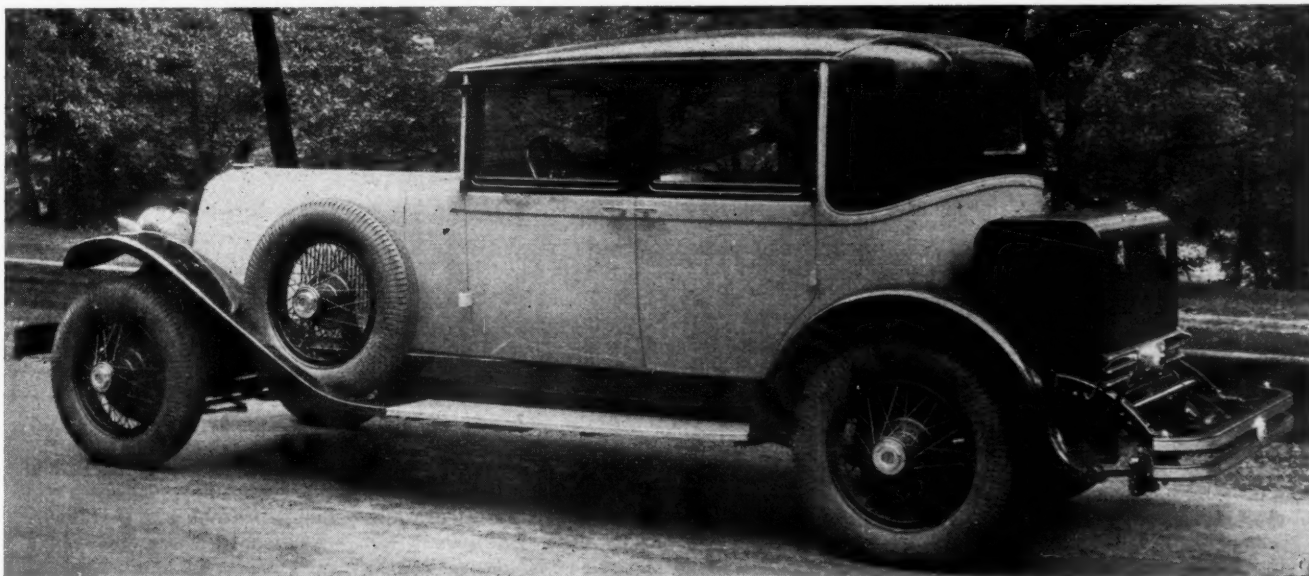
Pistons are of aluminum alloy and connecting rods are of steel. The crankshaft is carried on five main bearings, while the camshaft, which is driven by a link belt chain with automatic idler, rides in seven bearings.

A gear pump is used to supply oil under pressure to all bearings. A dual carburetor with dual intake

manifold is used. While a three-speed transmission is regularly supplied, a four-speed transmission may be had on special order. The brakes are of the latest Lockheed design and use drums of 16 in. diameter.

Wheelbase is 141 in., while the tread is 57 in. A unique and practical feature of the engine which assists in giving it its clean lines is the cast aluminum cover which goes over the top of it. This cover protects the ignition unit, wiring and plugs from dirt and moisture.

Prices range from \$4,360 to \$5,750. Special jobs may be had on order. The chassis only lists at \$2,675. Standard equipment includes shock absorbers.



New du Pont Model G club sedan

First with
the News

Reliable and
Accurate

News of the Industry

PAGE 314. VOLUME 59

Philadelphia, Saturday, September 1, 1928

NUMBER 9

Heavy Retail Sale Holds Car Stocks to Minimum

PHILADELPHIA, Sept. 1—Continuance of automotive manufacturing in September at a rate of around 400,000 vehicles a month is practically assured by the large number of orders which will be carried over into that month by leading car manufacturers. Orders for models presented during the last two months have run far ahead of factory production capacity, demand in recent weeks being almost as heavy as in the days immediately following the car introduction.

Combined production figures of United States and Canadian factories in July show a total output of 415,671, comparing with 425,114 in June and with 279,472 in July last year. All indications at this time are that the August total will nearly equal July, though the excess over August, 1927, will probably be smaller.

Reports from the field indicate not only that dealer stocks are small but that they are non-existent in some lines. This applies particularly to those dealers handling recent now model cars though demand for cars of earlier introduction has been consistently large. Used car stocks generally are at much lower figures for the season and in relation to volume of business than in re-

(Continued on page 322)

Dodge Senior Line Priced \$1,575-\$1,845

DETROIT, Sept. 1—Dodge Bros. Corp. announced today a new Senior line including six body types at prices ranging from \$1,575 to \$1,845, slightly higher than previous models. Bodies, engine and chassis generally have been altered to a considerable extent to further improve comfort, convenience and performance.

All exterior hardware is chromium plated over nickel plate which, in turn, is applied over copper plating. The gearshift lever is within four inches of the wheel with the spark and throttle controls above the wheel. Improved manifolding, thermostatic radiator heat control, four point suspension, 5.55 compression ratio, and Invar strut type pistons are among the features of the new powerplant.

Chassis features include Lockheed brakes and Lovejoy shock absorbers.

Motor Wheel Sales to Reach \$30,000,000

DETROIT, Aug. 28—H. F. Harper, president of the Motor Wheel Corp. in a statement today said: "July figures just available show the largest sales volume of any month in our history and at this date August sales have exceeded July. A survey of business already booked for the balance of this year indicates that our sales will total close to \$30,000,000 for 1928, as compared with \$20,000,000 for 1927.

"This remarkable increase in sales volume has, of course, meant greatly increased earnings. Net profits for July of this year total \$312,028, as compared with \$105,557 for July, 1927. This is equivalent to over 56 cents per share on the present 550,000 shares of common stock outstanding, or over 45 cents per share on the 687,500 shares which will be outstanding after the issuance of the 25 per cent stock dividend.

"Net earnings, after taxes, for the seven months ended July 31, 1928, total \$1,643,602, as compared with \$1,142,516 for the first seven months of 1927 and \$1,542,834 for the entire fiscal year of 1927. Surplus as of July 31, is \$7,497,326."

Ford Moves Cork Equipment

NEW YORK, Aug. 29—Ford Motor Co. is reported reorganizing the factory at Cork, Ireland, for resumption of tractor manufacturing there to meet demand from the European market. The Cork factory originally was used for tractor assembly but was changed over to manufacturing operations on the car for British trade. These car operations are now being removed to the Manchester plant.

Seven Months' Total Increased to 2,431,656

1928			
	Cars	Trucks	Total
Jan. ...	212,281	27,875	240,156
Feb. ...	301,466	34,847	336,313
Mar. ...	387,053	43,804	430,857
Apr. ...	385,394	49,036	434,400
May ...	405,627	54,411	460,038
June ...	381,780	43,333	425,113
July ...	358,055	57,612	415,667
Total	2,431,656	310,888	2,742,544

1927			
	Cars	Trucks	Total
Jan. ...	211,395	42,907	254,302
Feb. ...	278,997	44,421	323,418
Mar. ...	365,634	52,033	417,667
Apr. ...	377,899	51,449	429,348
May ...	379,139	50,666	429,805
June ...	295,198	45,956	341,154
July ...	245,585	33,871	279,456
Total	2,153,847	321,303	2,475,150
Aug. ...	284,489	36,819	321,308
Sept. ...	235,121	36,519	271,640
Oct. ...	189,177	38,224	227,401
Nov. ...	114,076	25,743	139,819
Dec. ...	108,356	28,626	136,982
Total	3,085,086	487,234	3,572,300

Pontiac Plants Increase Employment 33 Per Cent

DETROIT, Aug. 27—Employment in Pontiac's four largest industrial plants which this summer has reached a new high total, is a third higher than a year ago, a survey made today shows.

Figures, in some cases approximation, obtained today show that present employment in the plants of the Oakland Motor Car Co., General Motors Truck Corp., Wilson Foundry & Machine Co. and Fisher Body Corp. is about 33 per cent higher than a year ago. Employment reported today is 20,680 as compared with 15,387 a year ago.

Brockway Doubles Sales

NEW YORK, Aug. 28—July deliveries of the Brockway Motor Truck Corp. were more than double those of July last year, according to M. A. O'Mara, president. Prospects are for continued good business, he said, the gains reflecting in part the acquisition of Indiana Truck Corp. in May.

Europe Best Market for Industry in '27

Leads in Total Imports and as Car Buyer—South America in Second Place

WASHINGTON, August 30—Importing 105,339 passenger cars, trucks and buses valued at \$80,554,300 during 1927, Europe regained first place as best customer for motor vehicles manufactured in the United States, supplanting Oceania, according to statistics compiled and just made public by the Department of Commerce.

Total exports of automobiles, trucks and buses from this country to all the world in 1927 were set at 384,199 units valued at \$277,875,621. The ratio of increase in the total exports in 1927 over 1926 was 24.3 per cent.

Europe took 28.8 per cent of the total; Oceania, the best customer in 1926, recorded a decrease of 13.4 per cent, taking 72,051 vehicles valued at \$46,078,576 and dropping to fourth place. South America was the second best customer of the United States, taking 84,589 vehicles valued at \$56,604,484. North America took 59,256 vehicles valued at \$48,752,161; Asia and Africa each took about 31,000 vehicles valued at almost \$23,000,000. Oceania was the only geographical subdivision to record a decrease.

Europe was the leading buyer of passenger cars, taking 32.4 per cent of the total exports, while South America was the best market for trucks and buses, taking one-fourth of the total. Europe's passenger car buying was 71.7 per cent more than in 1926. South America was runner-up in the passenger car classification, taking 18.7 per cent, increasing 90 per cent over 1926. Oceania took 14.8 per cent of the 1927 total passenger car exports.

Trucks and buses, South America by taking 25 per cent of the total, increased its takings in 1927 over 1926 by 72 per cent. Second place was taken by Oceania which accounted for 22 per cent of the 1927 exports and Europe was third with 18.8 per cent. North American imports of these lines totaled 15.6 per cent, Asia taking 9.5 per cent and Africa almost 9.

Trucks and buses now amount to 25 per cent of the total automobile exports.

Kissel Announces Prices

HARTFORD, WIS., Aug. 28—Prices just released on the new Kissel lines, description of which appears on pages 306 and 307 in this issue, show a range of \$1,595 to \$1,695 on Model 6-73, from \$1,995 to \$2,595 on Model 8-95, and from \$3,185 to \$3,885 on Model 8-126.

Itala Company Reorganizes

WASHINGTON, Aug. 30—The Fabbrica Itala, manufacturer of a well-known make of automobiles, has re-

cently gone through a financial readjustment tantamount to a complete failure although bankruptcy was escaped by refinancing, according to a cable from Rome to the Department of Commerce. By the refinancing the capital stock of 25,000,000 lire was reduced to 250,000 lire, or expressed in shares, the value per share has been reduced from 100 lire to 1 lira.

New Stutz Models Offer Special Body Features

INDIANAPOLIS, Aug. 27—A new "Country Club" five-passenger speedster, fitted with a traveling cabinet of walnut in the tonneau, has been introduced by the Stutz Motor Car Co. of America, Inc. The speedster body is mounted on the standard 145-in. chassis. The cabinet provides compartments for traveling equipment.

A new limousine model, the "Southampton," is much like the standard seven-passenger limousine, but the interior woodwork is featured. Window casings, door casings and the partition between the driver's compartment and the tonneau are embellished with walnut panels of the same material.

The seat cushions, of the embroidered reversible type, are filled with down and present the appearance of a luxurious davenport. The back cushions of the seat have been constructed with especial attention to comfort and extra removable cushions are provided for this purpose. The new car is priced at \$4,595.

Contest for Oldest Car to be Staged by N. A. C. C.

NEW YORK, Aug. 28—The National Automobile Chamber of Commerce will hold a contest for the oldest car, the one adjudged the oldest to be placed on exhibition at the New York show to emphasize the engineering developments of the past 30 years. Only cars built previous to 1900 are eligible. Prizes will be announced shortly.

Marmon Earns \$1,288,598

NEW YORK, Aug. 28—Marmon Motor Car Co. reports net earnings in the first six months of 1928 of \$1,288,598 after all charges, but before Federal taxes. This compares with earnings of \$1,239,532 in the full year ended June 30, 1927. The company reports unfilled orders the greatest in its history for mid-year operations.

Net profit of Stromberg Carburetor Co. for the first six months was \$179,220, an increase of \$71,975 over the first half last year.

Jordan Adds Landau Brougham

CLEVELAND, Aug. 27—A five-passenger landau brougham, listing at \$1,995, has been added to its Air Line Eight line by Jordan Motor Car Co. Individual front seats are used. Rear quarters are finished in black leather.

Business in Brief

Written by the Guaranty Trust
Co., New York, exclusively for
AUTOMOTIVE INDUSTRIES.

NEW YORK, Aug. 30—The dullness in business, which usually typifies the in-between seasons period, was reflected in last week's trade, although the jobbing trades in general showed signs of increased activity, especially in those parts of the North and South where early crops have brought funds to the agricultural communities.

COTTON MILL OPERATIONS

There were 1,200,000 fewer cotton spindles in this country on July 31, 1928, than there were at the same time last year, and the number of spindles actually operated at some time during July was 4,100,000 below the number operated in July, 1927. It is pointed out by one large cotton manufacturing and commission company that such reductions are appreciably making up for the excess production of cotton goods last year.

FREIGHT CAR LOADINGS

Freight loadings for the week ended Aug. 11 showed a decline of 4180 cars, as compared with the preceding week. This decline was due chiefly to a decrease in the loadings of miscellaneous freight.

PETROLEUM OUTPUT

The daily average gross crude oil production for the week ended Aug. 18 was 2,444,500 bbl., as compared with 2,389,200 bbl. for the preceding week, which is an increase of 55,300 bbl.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Aug. 25 was 99.9.

BANK DEBITS

Bank debits to individual accounts outside of New York for the week ended Aug. 24 amounted to \$5,202,000,000, an increase of 12 per cent over the corresponding week last year.

FEDERAL RESERVE REPORT

There were no outstanding changes in the loans of reporting member banks; loans increased only \$6,000,000. Nevertheless, the combined statement of the Federal Reserve banks for the week ended Aug. 22 was not so favorable as the statement for the preceding week. There was an increase in discounted bills of \$14,932,000, as compared with the previous week, and an increase of \$623,319,000 as compared with the corresponding week in 1927. Of this increase in discounted bills for the week, the greatest pressure was registered in the New York district where the increase was \$39,451,000. Holdings of bills bought in the open market decreased \$6,300,000 in this period.

Despite a slight decrease of \$22,099,000 in brokers' loans, the high call money rate continued between 7 and 8 per cent for the week ended Aug. 28.

September Schedules Show Continued Heavy Production

**Stocks of New Cars in Dealers' Hands Estimated by
Factories as Approximating 15 to 25 Days'
Supply—Sales 25% Ahead of 1927**

DETROIT, Aug. 31—A good possibility that 1928 passenger car and truck sales will exceed the best previous record is indicated by present favorable condition. Factories report stocks in dealers' hands are lower than they have been in three years; the used car situation is much less of a problem than last year, with stocks also reduced considerably. Retail deliveries are running 25 per cent higher at present than they did last year, and nearly every company has shown considerable sales gains of late.

Stocks of new cars in dealers' hands are equivalent to about an average of not more than a 15-day supply, factories estimate. Ford production has been stepped up somewhat during the past months, but dealers remain behind orders. Ford production, which during July was well under 60,000 cars, will run near 75,000 in August, with September estimates larger.

Chevrolet production for August totals around 95,000 cars, with but little, if any, curtailment scheduled for September. This company has already exceeded its best previous record, and will produce its millionth car for 1928 early in September. Stocks of new cars in hands of dealers are equivalent to about 12 days with a 25-day stock of used cars, this figure being well below normal. Stocks of trucks are considerably lower, and increases in truck production for September are anticipated.

Buick to Build 30,000

Production estimates for September for Buick Motor Co. are around 30,000 cars, or about the same as for August. A. H. Sarvis, assistant sales manager, states that the new cars are moving very fast and so far dealers have been unable to stock cars. Production is now at the rate of 1250 per day and will be continued at that figure during September, according to present indications.

August production for Dodge Brothers Corp. is in the neighborhood of 27,000, of which 6500 represents Graham Brothers trucks. W. M. Purves, assistant sales manager, states that orders on hand definitely indicate that September production will be maintained at the same rate and possibly exceed that of August. According to Mr. Purves, Dodge dealers have the lowest stocks of cars in three years for this time of year, both passenger cars and trucks being below normal working stocks.

Hupmobile is continuing at its record-breaking pace, according to R. S.

Cole, general sales manager. The August production of 6500 cars will be at least duplicated and probably exceeded during September, according to present indications, the company having on hand, as of Aug. 22, unfilled orders for 8079 cars from dealers. Mr. Cole further states that stocks of cars have been reduced by 548 units during the middle weeks of August, being equivalent to less than three weeks normal retail sales. A new weekly record for retail deliveries was again set by this company during the week of Aug. 18, with 2180 sales. The sales proportion of sixes and eights is running around one eight to every 2½ sixes, according to Mr. Cole.

Graham-Paige Schedules 10,000

Graham-Paige production for August is roughly 10,000 cars. Little curtailment, if any, is expected during September, according to F. R. Valpey, general sales manager, who also states that cars in dealers' hands represent a normal working stock, and do not exceed a 30-day sales quota. Used car stocks are also quite satisfactory, according to Mr. Valpey.

The De Soto Motor Corp., according to C. W. Matheson, vice-president in charge of sales, expects to produce 8500 cars during September, exceeding August production by about 2000, production being limited only by the rapidity with which material deliveries can be obtained, as the present indicated demand far exceeds present production rate. The Chrysler Corp. will also probably increase its September production over that for August, aided by the impetus given by the announcement of new models.

A 20 to 25-day stock of cars is at present in the hands of dealers, according to A. R. Glancy, president and general manager, Oakland Motor Car Co., the used car stock being about the same, and both being below normal. It is expected that September will show a production increase over August, although definite figures are not available for either month as yet.

Reo September Quota 5600

Increased production for September is also scheduled by Reo Motor Car Co., according to C. E. Eldridge, assistant sales manager. Production for August is approximately 5000 units, as compared with 4468 last year, with September quota calling for 5600 units as compared with 4218 for September, 1928. Production runs around 40 per cent trucks to 60 per cent passenger

cars at present. A 15-day stock of cars is in dealers' hands at present. Truck production for Reo has already exceeded its total 1927 truck production.

Oldsmobile dealers have an average of not over 2½ cars per dealer at present, according to D. S. Eddins, vice-president and general sales manager, and as a result September production will be boosted to 10,000 units. August production was considerably below this figure, due to the annual 10-day vacation period for factory employees. Except for this period, production will have shown no curtailment from April 1 through September.

Increases in production for September over August are also scheduled by Packard Motor Car Co. Due to its price reductions on the six-cylinder models in July, in anticipation of the introduction of new models, dealers' stocks of these models have been rapidly reduced and stocks are at present considerably below normal.

Willys-Overland, Inc., will have produced around 30,000 cars by the end of the month, according to A. B. Qualy, secretary of the company, and the same production is scheduled for September with the possibility of a slight increase.

In the truck field, Federal Motor Truck Co. has just finished its biggest month in its history, with no anticipation of curtailment in production for September. Dealers' stocks are stated to be unusually low for this time of year, with used truck stocks reduced by about one-half during the past two months.

No Bad Spots in Sight, Grant Says on Coast

OAKLAND, CAL., Aug. 27—The impending national election will cause no slump in automobile sales, in the opinion of W. F. Knudsen, president, and R. H. Grant, vice-president and director of sales, of the Chevrolet Motor Co., who are on tour of the principal automotive merchandising centers of the United States.

"Business conditions throughout the country are uniformly good," said Grant, "and we expect the next year to be the greatest in automobile merchandising history. Foreign consumption of automobiles is increasing at a rapid rate. The used-car market, the regular bugbear of the industry, has shown greater strength this year. Dealers are moving used cars, which shows that business in general must be good. On our entire trip through this country we found conditions good, with no fear of a slump, or a 'bad spot' in trade for the balance of 1928."

Group to Buy Ajax Plant

TRENTON, N. J., Aug. 27—Announcement has been made that a group of tire engineers and capitalists of Philadelphia will purchase the local plant of the Ajax Rubber Co. of Racine, Wis. Agents of the Philadelphia group inspected the Trenton plant and found it equipped for operation. The plant has been closed one year.

Chrysler to Build Pacific Coast Plant

Company to Make \$7,000,000
Investment in Factory to
Serve Western Trade

OAKLAND, CAL., Aug. 27—The Chrysler Corp., through W. H. Kilpatrick, announces the immediate construction of an automobile assembling and body-construction plant at San Leandro, a small city a few miles from Oakland. The site covers 51 acres, and was purchased for \$200,000 from the Henrietta Farrally estate, the probate court of Alameda county confirming the sale, and fixing the price.

The plant, complete with the site, will cost approximately \$7,000,000, according to announcement by the Oakland Chamber of Commerce, which handled the deal. Employment will be given to 5000 workers, and the plant will serve the Pacific Slope, the Hawaiian Islands and the Orient. Design and construction will be handled exclusively by engineers of the Chrysler Corp.

In the immediate vicinity of this site are already located the assembling plants of the Chevrolet, Durant and Caterpillar Tractor companies.

Durant Plant Ready Nov. 1

LANSING, Aug. 27—Operations in the new \$750,000 Durant factory here will begin the latter part of October or early in November, according to W. R. Willett, assistant to W. C. Durant. Delay, according to Mr. Willett, is due to the lack of completion before late October of the new \$250,000 power house addition. Actual construction of the new plant, which will house the Lansing Durant body division, will be completed some time between Sept. 15 and Oct. 1.

Mr. Willett said he expected Mr. Durant to return from Europe around Nov. 1, at which time it is expected he will inspect the new Lansing additions.

Pyrene Buys Norwesco

TORONTO, Aug. 25—Pyrene Co. of Canada, Ltd., has taken over the capital stock of Norwesco of Canada, Ltd. Each company will continue to operate as a separate manufacturing unit, but the Norwesco sales will be handled by the Pyrene sales organization. The Pyrene warehouses in Winnipeg, Manitoba, Vancouver and Montreal will provide shipping centers for Norwesco products. Pyrene will market its product exclusively through wholesale distributors.

Erie Adds Oil Electric

NEW YORK, Aug. 28—The Erie Railroad Co. has bought a 300 hp. oil-electric locomotive from the Ingersoll-Rand Co., the General Electric Co. and the American Locomotive Co. This is the fourth of these units purchased by the Erie Railroad Co.

New Fairchild Engine is Tested by Navy

WASHINGTON, Aug. 30—A four-cylinder, 130 hp. radial type Fairchild Caminez airplane engine, representing a radical departure from present recognized types, is being tested at the Naval Air Station here in a newly designed training plane built by the Boeing Airplane Co., Seattle. The engine has neither connecting rods nor crankshaft. The propeller shaft is attached to a cam which is moved by the four pistons which are equipped with rollers running on the track of the cam. The engine takes a propeller of large diameter and develops 130 hp. at 1000 r.p.m.

Canada Registration Near Million Mark

TORONTO, Aug. 28—Automobile registration in Canada will pass the 1,000,000 mark by the end of 1928, according to a bulletin recently issued by the Bureau of Statistics at Ottawa. "There were 945,672 motor vehicles in Canada, on June 1," the bulletin declares. "This was an increase of more than 60,000 compared with the beginning of the year. If the rate of increase in automobile purchases is maintained for the next few months, the 1,000,000 mark will soon be reached.

More than 45 per cent of all the automobiles owned in Canada are registered in the province of Ontario. That province's total is 436,120, or an average of 13.7 cars per 100 population. Quebec ranks second with 128,459 cars, or 4.9 per hundred. The prairie provinces of Manitoba, Saskatchewan, and Alberta, where farming is experiencing a rapid development in areas served by the Canadian Pacific Railway, have a combined car registration of 244,329. British Columbia has 77,617 cars; Nova Scotia, 30,059, and New Brunswick 24,544.

"Canada is building good roads to keep abreast of increased automobile ownership. Reports from every province received by the Canadian Good Roads Association indicate that more money will be spent on highway construction throughout the Dominion this year than in any in history.

Midland Gets New Orders

CLEVELAND, Aug. 27—Further plant and production expansions are being planned immediately for the plants of the Midland Steel Products Co., according to an announcement from E. J. Kulas, president. A large order of automobile frames from Canada and a new domestic order for brakes indicate the greatest volume output for Midland in its history. Double shifts are being arranged.

New Parts Ratings Obtained by N.A.C.C.

Railroad Committee Agrees to
More Favorable Classification
of Shipments

NEW YORK, Aug. 27—Following an application by the National Automobile Chamber of Commerce traffic department, and a hearing before the consolidated classification committee of the railroads, proposals for more desirable classification of several automobile parts have been approved, according to announcement sent by J. S. Marvin of the N.A.C.C. to members of the chamber.

Steering gear assemblies with steering wheels attached will hereafter be accepted racked or braced in freight cars at the third-class rating, whereas such shipments heretofore have been subject to double first class unless packed.

Similar arrangement has been effected for steering gear assemblies without steering wheels when racked in freight cars, and the carload rating has also been ordered reduced from fourth class to fifth class in the South.

Mixed carloads of automobile driving chassis or driving trucks with freight trailer trucks or wagons will be taken at second class, minimum weight 12,000 lb. instead of second class, minimum weight 20,000 lb.

These items have been approved for publication in the official tariffs at an early date.

Shipments Into Mexico Gain in July and August

LAREDO, TEX., Aug. 27—July and August automobile exports through this port into Mexico were the heaviest of the present year. During the two months a total of 300 carloads of automobiles made in the United States moved into Mexico. Low priced cars led the field for July and August although there were a good many medium and high priced cars.

Reports here are that the movement of American-made automobiles into Mexico through El Paso, Brownsville and other points also has been heavier than usual. The majority of the cars going into Mexico are for Mexican owners. It is said good roads and better conditions are responsible for increased automobile business.

Willys Plant to Open Sept. 15

LOS ANGELES, Aug. 27—The assembly plant of the Willys-Overland Co., now under construction in Los Angeles, will be opened for operation Sept. 15, according to an announcement by Colin Campbell, vice-president in charge of sales, who is now in Los Angeles. The program calls for the assembling of 300 cars daily, and a payroll of 800 men at the local plant.

Men of the Industry and What They Are Doing

Industry to Participate in Industrial Conference

Twenty-five industrial leaders have accepted appointment to cooperating committees which will direct the National Conference of Major Industries to be held at Columbia University, Oct. 24. The conference will be under the joint auspices of the School of Business of the University and the Institute of American Meat Packers, with the cooperation of the Chamber of Commerce of the State of New York and the Merchants' Association of New York.

Speakers from five important divisions of industry have accepted invitations to discuss the current situation in the industries which they represent. Among these is Alvan Macauley, president of the National Automobile Chamber of Commerce.

Invitations will be extended to representatives of other important industries, including the transportation industry and the communication industry. These discussions should provide a comprehensive analysis of the present status of American industry.

The cooperating committees include automobiles—Walter P. Chrysler, chairman of the board and president, Chrysler Corp.; Alfred P. Sloan, Jr., president General Motors Corp., and Alfred Reeves, general manager, National Automobile Chamber of Commerce.

Aviation—W. W. Atterbury, president, Pennsylvania Railroad Co.; C. M. Keys, president, Transcontinental Air Transport, Inc., and Harold M. Bisby, chairman of the board, St. Louis Chamber of Commerce.

On the printing and publishing committee is A. C. Pearson, president, United Publishers Corp.

The concluding event of the conference will be a dinner to pioneers of American industry. Guests of honor who have already accepted invitations include George Eastman, Thomas A. Edison, Harvey S. Firestone, Charles M. Schwab, Orville Wright and Julius Rosenwald.

Gerspacher With Columbus

D. S. Brisbin, vice-president in charge of sales of the Columbus McKinnon Chain Co., has appointed R. E. Gerspacher as assistant sales manager in charge of automotive sales. Mr. Gerspacher was associated with the C. G. Spring & Bumper Co. for a number of years and for the past year has been district manager of the Columbus McKinnon company Chicago office.

Carroll Joins G.M. Export

George Carroll, for the past four years New York district sales manager of the Cadillac Motor Car Co., has joined General Motors Export Co. as Cadillac-LaSalle specialist.

Charles Fisher Buys Brady Racing Stable

Charles T. Fisher, of the Fisher Body Corp., has entered the sport of kings, having purchased the famous Dixiana thoroughbred nursery farm, property of the late James Cox Brady, near Lexington, Ky., paying \$240,000 for its 343 acres, buildings, paddocks, etc., according to a deed registered at Lexington, on Aug. 23.

Norberg Succeeds Willard

T. A. Willard has resigned as president of the Willard Storage Battery Co. and has been succeeded by R. C. Norberg, a close associate of Mr. Willard's in the company for the past 25 years. Mr. Willard remains on the board of directors, residing in California where he has a laboratory and will continue to work on storage battery development. Mr. Norberg previously was vice-president and general manager, to which position he rose from his first connection in 1903 as a draftsman.

Brockway Goes Abroad

George A. Brockway, chairman of the board of directors of the Brockway Motor Truck Corp., has sailed for an extended trip abroad. Mr. Brockway will visit points in England, Holland, Germany, Italy and other countries. He expects to return to Cortland in October.

Cusac Joins Armitage

W. R. Cusac, formerly chief chemist of Dodge Brothers, Inc., having technical supervision of lacquer, varnishes and enamels at that plant for 13 years, has joined the selling organization of J. L. Armitage & Co., Newark, N. J. Mr. Cusac will have headquarters in Detroit.

Perfex Advances Birdsell

D. T. MacLeod, president of the Perfex Corp., Milwaukee, builders of Ford replacement radiators, announces that at the last Directors' meeting, Roger Birdsell, sales manager of the corporation, was elected to the directorate and vice-presidency.

Rothman Aide to Ewald

E. E. Rothman has been appointed assistant to Henry T. Ewald, president of the Campbell-Ewald agency. Mr. Rothman has been with Campbell-Ewald for seven years, serving in all departments.

U.S. Chamber of Commerce Names Foreign Committee

William Butterworth, president of the Chamber of Commerce of the United States, has announced the new foreign commerce department advisory committee for the year 1928-1929. A wide variety of foreign trade interests, established in all important geographical sections of the country, are represented on the new committee.

Charles W. Lonsdale, president, Simonds-Shields-Lonsdale Grain Co., Kansas City, a member of the chamber's board of directors, will continue as chairman. Henry D. Sharpe, president of Brown & Sharpe Mfg. Co., former chairman of the committee, and member of the board, will continue as a member.

Other members include H. H. Rice, assistant to the president, General Motors Corp., and L. P. Thayer, vice-president of the International Harvester Co., Chicago.

The first meeting of the new committee will be at Hot Springs, Ark., Oct. 6, in connection with the chamber's conference of national councillors and presidents and secretaries of organization members.

Leighton Leaves Navy

Lieut. Comdr. Bruce G. Leighton, chief of the plans division of the Bureau of Aeronautics, U. S. Navy, who is credited with having contributed more to the development of the air-cooled radial engines as now used in the Navy and commercial work than any other person, has tendered his resignation effective Oct. 1. It is understood that he is joining the force of the Wright Aeronautical Corp. to take complete charge of sales and to assist in other ways in the affairs of the company.

Walker Joins Grams

F. B. Walker, formerly general sales manager for Franklin Automobile Co., succeeds J. H. W. Mackie as head of the Graham-Paige Co. of Minneapolis. Robert C. Graham is president of the company. The territory is Minnesota, North Dakota, eastern Montana and northwestern Wisconsin. Mr. Walker was formerly with Dodge Brothers.

Millhoff Leaves Miller

F. C. Millhoff, former general sales manager of the Miller Rubber Co., and more recently manager of car and truck manufacturer sales, has resigned to take a long needed rest before announcing his new plans.

Harder Joins Budd

D. S. Harder, formerly director of standards of the Durant Motor Co. of New Jersey, has joined E. G. Budd Mfg. Co. at Detroit.

Trade Publications Combine

PHILADELPHIA, Aug. 27—Combination of *The Automobile Trade Journal* and *Motor Age* into a single monthly publication devoted to the interests of the automotive trade was announced here today by the Chilton Class Journal Co. This merger of the two oldest automobile trade publications in the country was brought about, according to C. A. Musselman, president of the company, to help further the progress toward more efficient marketing methods which has been an important concern of the automotive industry for some time past. Both magazines first began publication in the fall of 1899. The new publication will be called "*Automobile Trade Journal and Motor Age*," and the first issue will be in December.

M. & A.M.A. Board Reports Progress on A.E.A. Merger

NEW YORK, Aug. 25—Continued progress in negotiations for consolidation of the Motor & Accessory Manufacturers Association with headquarters in New York, and the Automotive Equipment Association, with headquarters in Chicago, was announced today at the offices of the former organization. J. M. McComb, president of the M.&A.M.A., made the following statement:

"The Board of Directors of the M. & A.M.A. at their regular meeting this week received a report of progress from the special committee which is arranging the details of merger with the A.E.A. The committee reported that many of the essential details have been agreed upon. The constitution and by-laws have not been completed and some important details have not been mutually agreed upon but it is anticipated there will be no difficulty in reaching satisfactory agreements upon these and the consummation of the merger can then be readily effected. After the next meeting of the two committees the directors will be in position to refer the whole subject to the membership of the M.&A.M.A. for ratification."

Service Parts Activities Endorsed by A.E.A. Group

CHICAGO, Aug. 25—Manufacturers of service parts, members of the Automotive Equipment Association, met in Chicago yesterday to hear a review of service parts activities of the association since the Mackinac Island convention and plans for the future.

L. F. Iverson of the Piston Ring Co., presided over the group meeting, the principal feature of which was a report by Martin Goldman, manager of the service parts division of Greater Market Development, A.E.A. At the completion of Mr. Goldman's report of past activities and future plans, the group voted complete satisfaction.

Ternstedt Awards Medals

DETROIT, Aug. 28—Ternstedt Mfg. Co. staged its annual old timers' picnic and field day at Bob-Lo this week, featured by the awarding of service medals

by T. P. Archer, president. A chest of silver for the largest old timer's family present was awarded to William Stager, assistant superintendent. The company numbers six ten-year men and more than 600 who have been with the company over five years.

Ohio Dealers to Hear Vane on 1928 Features

COLUMBUS, Aug. 27—The program of the annual meeting of the Ohio Council, National Automobile Dealers' Association, to be held at Cincinnati, Sept. 13 and 14, will be featured by a talk by C. A. Vane, general manager of the national association, on "What 1928 has Shown the Dealers." Mr. Vane will make a resume of the year.

J. W. Loranger, supervisor of districts of Packard Motor Car Co., will discuss "How to Prepare Your Budgets to Care for Your Business."

M. D. Graham will speak on "The Aftermarket and Service Help to Pay Dealers' Expenses." Warren Griffith, second vice-president of the Ohio Council will talk on "1929, a Legislative Year. What we must do."

"Automobile Salvage Yards" will be discussed by A. B. Waugh, commissioner of the Omaha Auto Trade Association, and R. C. Borden and A. C. Busse both of New York, will put on a stunt "Win the Argument—Lose the Sale."

Fernand Charron

PARIS, Aug. 14 (by mail)—Fernand Charron, winner of the first race for the Gordon Bennett Cup, died at his home at Maisons Laffitte, near this city, yesterday, at the age of 62. After being a successful bicycle rider, Charron sold bicycles in Paris and in 1897 entered the automobile business. Driving Panhard Levassor cars, he won numerous early road races, among them being Paris to Amsterdam, Marseilles to Nice, and Paris to Bordeaux. He founded the Charron, Girardot & Voight Company, builders of the C.G.V. car. He was responsible for the Charron Automobile Company, and later produced the Alda car. During the last years of his life he was Citroen dealer in Paris. Fernand Charron was a son-in-law of Clement Bayard, who died in Paris a few months ago.

Financial Notes

Chain Belt Co. stock has been listed on the Chicago Stock Exchange. A syndicate of Chicago bond houses bought 48,119 shares of the common stock, 40,870 shares of which were purchased from individuals and approximately 7000 shares representing new financing. Proceeds of the sale of the additional shares, plus other funds, will be used to retire all preferred stock of the company. The common stock with 120,000 shares outstanding will then represent the company's entire capitalization. The common is being offered at \$41 and was placed on a \$2.50 dividend basis.

Motor Wheel Corp. has declared a 25 per cent stock dividend, payable Oct. 15 to stock of record Sept. 10. An extra cash dividend of 25 cents per share will be payable Sept. 20 to holders of stock as recorded on Sept. 10, the latter date being the one for payments of the regular third quarterly cash dividend of 50 cents per share. Stockholders who find themselves with fractional shares following the 25 per cent stock dividend will be given an opportunity to buy or sell such fractions as will make their holdings into an even block.

L. A. Young Spring & Wire Corp. has called for redemption as of Oct. 1, 1928, the next dividend payment date, its entire outstanding convertible preferred stock at the redemption price of \$35 per share, plus accrued dividends. It is advised by the company that all holders of preferred stock convert their holdings into common stock at once, inasmuch as on the call date only \$35 per share will be received for the preferred. Transfer books for the convertible preferred stock will be closed Sept. 29.

Western Auto Supply Co. reports for the six months ended June 30 net profit of \$288,704 after all charges and Federal taxes. This compares with a net profit of \$310,815 in the first half of 1927 and of \$931,578 for the full year of 1927. Computed on the present capitalization, the earnings for the first six months indicate a balance for the common shares equal to \$1.65 a share against \$1.80 a share in the first half of 1927.

Ajax Rubber Co. reports net loss in the first six months of 1928 of \$846,001 after all charges and write-offs, this comparing with \$861,158 net loss in the first half of 1927. The balance sheet as of June 30 showed total assets of \$14,066,149 against \$15,311,882 in 1927. Inventories of \$5,110,570 in 1927 were reduced to \$3,172,639. Cash of \$1,200,002 was reduced to \$944,842.

Pierce-Arrow Motor Car Co. and its subsidiary sales company as of June 30 shows total assets of \$23,594,204 against \$24,373,081 on Dec. 31. Cash increased from \$1,515,291 to \$2,838,540 and inventories decreased from \$9,852,783 to \$8,195,605. Surplus June 30 was \$1,291,570 against \$1,933,789 on Dec. 31.

Builds New Lansing Plant

LANSING, Aug. 27—Lansing Paint & Color Co. has just completed the erection of a new plant for the manufacture of nitro-cellulose lacquer, according to announcement Saturday by William S. Hatten, general manager.

Semi-Finished Steel Higher in New List

Sizes, Chemical Specifications and Quality Covered to Eliminate Profit Leaks

NEW YORK, Aug. 30—Issuance of a new card of chemical extras on finished steel products by one of the leading interest's subsidiaries has now been followed by preparation of a new list of extras on semi-finished steel descriptions, covering size, chemical specifications and quality. These revisions, together with that recently made in the cash discount on sheets, are all part of the steel industry's determination to eliminate the leaks that eat into profits.

When the gage base for sheets was changed two years ago, it was found that the advances which resulted from this change came in for less resistance on the part of buyers than is usually the case when flat announcements of so many dollars per ton advance in the price of this or that product are made. There is no evidence at this time that consumers are offering any resistance to the downward revision in cash discounts on sheets. On the other hand, the out-and-out advances in fourth quarter prices still have to run the gauntlet of consumers' reluctance to pay higher price for their raw material which they are unable to pass on to the ultimate consumer.

There is some doubt as to whether the \$1 per ton advance in the price of sheet bars will not be followed by another \$1 advance, so as to reestablish the differential between sheet bars and between billets and slabs that prevailed until a few months ago. Cold-rolled strip steel is now quoted on the basis of representative tonnages instead of, as heretofore, on small lots minus differentials for tonnages. The producers are striving to establish the fourth quarter market for cold-rolled strip steel on a \$2 per ton higher basis. Cold bar finishers are booking business for the remainder of the third quarter at 2.20 cents, Pittsburgh, withholding so far fourth quarter quotations. Volume of shipments to automotive consumers continues very fair.

Pig Iron—Middle West furnaces have booked heavy orders for shipment over the year's remainder. In some markets advances have been chalked up, and opportunities for picking up bargains, so plentiful a short time ago, seem to have passed.

Aluminum—A fair amount of new business is being booked from automotive consumers covering early fall requirements. Bonded warehouse stocks on July 1 were less than 4,000,000 lb., the lowest tonnage since November, 1926. Canadian shipments of aluminum into the United States so far this year are running 35 per cent behind those of last year, but one single shipment from the domestic producer's Canadian plant can alter this situation over night. Market prices and conditions ride on an even keel.

Copper—Advances in the price of copper are freely predicted by leading producers.

Ontario Public Commercial Vehicles to be Taxed on Gross Ton Miles

OTTAWA, Aug. 27—Much interest has been aroused among motor vehicle owners and users in the Province of Ontario through the enactment of the Public Commercial Vehicles Act, which was passed by the Ontario legislature this year. This legislation, which now becomes effective, provides for the taxation of motor freight transport lines with the view to obtaining more substantial contributions toward highway maintenance.

Under the new law the license fee is at the rate of one-fifth of a cent per gross-ton mile. Gross-ton miles are figured by taking the gross weight of the vehicle with its load, multiplied by the number of miles covered.

The regulations include a number of interesting features, one of which is compulsory insurance. Operators are required to carry \$3,500 insurance on the goods and merchandise entrusted to them. The legal fire extinguisher must be carried on the vehicle. A maximum of 10 working hours in 24 is laid down for drivers. All accidents resulting in loss of life or injury to persons or property must be reported to the Ontario highway department. Use of uniform bill of lading, approved by the Ontario department is required.

A public commercial vehicle is defined by the legislation of 1927 as a motor vehicle operated on a public highway by or on behalf of any person who holds

himself out to the public as carrying on the business of a public carrier of goods, wares or merchandise exclusively. That is to say, the act applies to trucks which are common carriers, operating through two or more municipalities, and not under contract with any one shipper. It does not apply, of course, to the truck in private service.

Up to the present time operators of these transport trucks have had to obtain only the usual motor vehicle permit, fee for which is based on gross weight. The act of 1927 lays down that no person shall conduct upon a public highway by means of a public commercial vehicle the business of a public carrier of goods unless licensed to do so by the department. The minister has authority to grant or refuse licenses as he sees fit, and it is pointed out that when issued they are not franchises. Forms will be supplied all the operators, upon which they must make a return of every trip on which each licensed vehicle operates. The department will bill them once a month for the tax, which is to be payable by the 10th. The motor vehicles branch will be responsible for enforcement, with highway traffic officers checking up as occasion may arise. This branch now administers the Public Vehicles Act affecting buses. Public commercial vehicles will be subject to inspection at all times.

This sentiment has been helped by a temporary scarcity of metal for spot delivery to consumers who had not provided against their full August requirements. Some buying for September needs still overhangs the market, and very little copper has been engaged for October delivery so far.

Tin—The market continues easy and quiet. Low prices on futures are attractive to large consumers.

Lead—Following the first advance in some time, amounting to \$2 per ton, consuming interest became more brisk, and storage battery manufacturers are no exception from this condition.

Zinc—The market is quiet and steady.

Thomas G. Meachem Dies, Was New Process Head

NEW YORK, Aug. 25—Thomas G. Meachem, for a number of years vice-president and general manager of the New Process Gear Corp., Syracuse, N. Y., and a pioneer in the development of gears for the automotive industry, died Aug. 17 in this city following an operation. He had been in ill health for about three months.

Born at Onondaga Valley, N. Y., in 1878, Mr. Meachem attended Syracuse High School and St. John's Military Academy. In 1900 he became identified with the New Process Rawhide Co., founded by his father in 1888, which was engaged in cutting rawhide pinions and gears. The company later became the New Process Gear Corp.

Hardwood Sales Indicate High Production Schedules

ATLANTA, Aug. 28—Demand for southern hardwoods from the automobile and body industries has continued steadily upward the past two or three weeks. While most orders being booked continue to be for current or near future wants only, business as a whole is better than it has been in some months. Manufacturers who have placed their new models on the market are manifesting particular interest in hardwoods at this time, and from their inquiries for needs the last part of the year it seems that automobile production schedules will be heavy.

Demand continues especially good, however, from the body plants, mainly those in the southeastern and middle western territory, with this business as a whole considerably better than it was at this time last season, and the outlook indicating it will continue brisk through the rest of this year.

Extends Theft Coverage

NEW YORK, Aug. 25—The Eastern Automobile Underwriters' Conference has authorized the use of the broad form of theft coverage in New York, Philadelphia and parts of New Jersey from which it formerly had been reserved.

Registrations Gain 46,270 in Bay State

Passenger Cars Increase 44,627
and Trucks Rise 1434—
August Shows Gain

BOSTON, Aug. 25—Registration figures for July show there were 6340 more cars registered in Massachusetts this year than for the same month a year ago. The gain in trucks was 392. For the year to Aug. 1 the increase in registrations reached 44,827 cars and 1443 trucks. The gain in fees was more than \$500,000. Here are the figures:

Year to Aug. 1	1927	1928	Gain
Passenger cars.....	641,908	686,735	44,627
Commercial vehicles	87,987	89,421	1,434
Total.....	729,886	776,126	46,270
Taxis included in passenger cars.			
Bus	1,352	1,641	289
Trailer	420	520	100
Motorcycle ..	6,004	5,546 (drop)	458
Makers, Dealers, etc....	1,978	2,217	239
Original licenses	65,524	68,728	3,204
Renewals ..	469,612	496,877	27,265
Total fees..	\$11,459,603	\$12,046,794	\$587,190
August Totals	1927	1928	Gain
Passenger cars.....	31,479	37,819	6,340
Trucks	2,321	2,713	392
Total.....	33,800	40,532	7,732

40 Standards Revised by S.A.E. Committee

WASHINGTON, Aug. 25—Forty new and revised standards for aircraft and motor vehicle parts and fittings are covered in reports submitted by divisions of the standards committee of the Society of Automotive Engineers, the Department of Commerce announces.

Eighteen of these relate to aeronautic standards, such as dimensions and weight of aircraft storage batteries, propeller hubs, tail-skid shoe mountings, engine starter mountings and the like. Among the standards affecting the motor vehicle world is the proposed standardization of 18 balloon tires and rim sizes to reduce the existing number, viscosity numbers for prediluted crankcase lubricating oils as well as undiluted oils, sizes for lamp bases and sockets and plate glass specifications.

Excello Tool Expands

DETROIT, Aug. 30—On Sept. 1 the Excello Tool & Mfg. Co., manufacturer of drill jig bushings, grinder spindles and aircraft engine parts, will move into its new Detroit plant. The plant has a floor space of 3500 sq. ft., which represents a 150 per cent increase over present facilities. The increase in floor space is due to rapid increase in business from the aircraft industry in addition to a normal growth of its other lines.

Excise Tax Receipts Decline \$15,000,000

WASHINGTON, Aug. 29—Total tax receipts of the Federal government for the fiscal year ended June 30, 1928, were \$2,790,535,537, of which \$51,628,265 was collected from the automotive industry. The excise tax collected from the industry in 1928 was approximately \$15,000,000 less than the automotive tax in 1927, which aggregated \$66,437,881. It cost the Federal government \$1.18 to collect each \$100 the last fiscal year, compared with \$1.15 per \$100 in the fiscal year ended June 30, 1927.

Continuity of Style Displayed by Auburn

AUBURN, IND., Sept. 1—Four Auburn cars, making up a caravan, have left here in a tour of the country to demonstrate how the buyer's investment is protected through the continuity of Auburn design. Models for 1925, 1926, 1927 and 1928-29 made up the caravan. It has been the policy of Auburn since E. L. Cord became president to make no radical changes in designs, obsoleting previous models.

The 1925 model in the caravan has been run more than 100,000 miles and has been overhauled once in that period. The 1926 model has been run about 80,000 miles with one overhauling. Each car's history, with all owners' names and addresses, is attached to the individual car.

Invents Automatic Jack

WASHINGTON, Aug. 26—From Paris to the Department of Commerce comes the report of the invention of an automatic automobile jack which operates from the instrument board to raise one or more wheels of an automobile. This device consists of cylindrical attachments for the axles of a car near each wheel. In case of a flat tire, the motorist pushes a button, the cylinder straightens out and the wheel is raised from the ground.

Forms Air Traffic Association

CHICAGO, Aug. 25—Representatives of the various air transport companies operating into Chicago announced this week the organization of the Chicago Air Traffic Association, intended to aid in making Chicago a commanding center of air traffic. Thomas Wolfe, Jr., of National Air Transport, was elected president; W. A. Peterson, of Northwest Airways, and Floyd S. Trothero, of the Embury-Riddle Co., vice-presidents; W. A. Patterson, of Boeing Air Transport, treasurer, and Ralph N. Gardner, of the Robertson Aircraft Corp., secretary.

31 Foreign Makers Take German Space

Favorable Reaction to German
Cars Seen Resulting from
Comparisons

BERLIN, Aug. 14 (by mail)—The number of entries so far lying before the Association of German Automobile Makers for stands in the International Motor Show to be held Nov. 8 to 18 at Berlin far exceeds expectations. Applications for 237,000 sq. ft. of room have been filed and further ones are continuing to come in so the organizers are experiencing great difficulties in allotting the room. A large number of applications could only be accepted conditionally subject to it being possible to find further room.

The number of applicants is said to exceed 600, and the lists of entrants previously published contain 31 foreign makers. The show will comprise every type of motor vehicle, accessories and tools. There will be divisions for passenger cars, commercial and municipal vehicles, buses, motorcycles, bodies, machine tools, accessories and equipment distributed over four large halls, which are connected with one another by bridges.

The 31 foreign entrants include of American makers: Dodge Brothers (London branch), Chrysler, Durant, Falcon, Graham-Paige, International Harvester, Nash, Studebaker, Willys-Overland, Stearns and Fleetwood Body. Great Britain will be represented solely by motorcycle makers. Of French makers the following have so far been published, Delage, Renault, Carrosserie B. Gindine, Talbot, Sizaire Freres and Citroen. Switzerland will send Scintilla and Motosacoche; Belgium, Minerva; Austria, Austro-Daimler, Steyr and Puch; Czechoslovakia, Tatra, and Italy, Fiat and Lancia. The lists are, however, not complete and further names will ultimately appear.

At a recent meeting with members of the press, Dr. Scholz, the director of the Association of German Automobile Makers, said that the German automobile industry greatly welcomed this first great international exhibition to be held since the war in Berlin as it felt confident the show will prove that German cars are now in every detail up to the very highest foreign standards and disperse the belief, entertained by many German buyers, that German cars do not offer the same value.

Norway Revises Tariff

WASHINGTON, Aug. 25—Norway has put into effect an 18 per cent flat ad valorem duty on parts and motors for automobiles, motorcycles and airplanes, supplanting various rates previously in the tariff schedule of that country, according to an announcement by the Department of Commerce.

Car Stocks Low as Sales Continue High

(Continued from page 314)

cent years. Buying is holding closely to the level of new car buying. Dealers throughout the country express conviction of a maintenance of the buying movement well into the last quarter.

Reports from leading cities follow:

Boston

Motor car sales began to slow up during the third week of this month for both new and used cars. They had carried through from July very well so that the average was better than a year ago. Announcement of new models brought many buyers to the salesrooms. Dealers are not worried, for their stocks are depleted in new cars and they are not piling up trouble taking in old ones to make sales. The market is really very good.

New York

August sales in the metropolitan area, while showing a slight decline from July levels, are running well ahead of the corresponding period a year ago. Dealers' new and used car stocks in the main are in good condition.

Atlanta

Movement of new car merchandise continues brisk, with sales during August again showing a nice gain over the corresponding month of 1927. The outlook promises there will be a continued active call for new cars the next two months at least. The public is manifesting considerable interest in the new models and late summer and fall sales promise to be heavy. Most dealers are reported carrying about normal new car stocks save in some of the smaller centers where stocks are a little larger than normal. The used car situation continues unfavorable. Truck sales continue heavy.

Cleveland

Exceptionally brisk new car sales are reported by dealers, the total for 27 days of August being considerably ahead of the record in July, which was regarded as a banner month. New models by several of the largest makers, coupled with continual delivery of long delayed Ford orders, are seen as chief factors. Consistently steady movements in used cars are reported with low prices enabling dealers to keep their floors reasonably cleared.

Chicago

Retail sales of automobiles for August set a new monthly record for this year. They also were approximately 15 per cent greater than August last year. New car stocks on hand are small, in many cases hardly sufficient to supply the demand. Used car sales have been heavy and stocks are not regarded as abnormal for the season of the year.

Cincinnati

Business with automobile dealers as well as accessory men and tire stores during the present month is certain to establish a record for August, with an average daily increase of 21 per cent in new car sales and 34 per cent in used car registrations. The total figures for the month are expected to show a gain of approximately 30 per cent over last year and a good margin over July. The unusually

good demand is being felt by all and in the cases of the more popular cars, dealers are having trouble in making prompt deliveries. New car stocks on hand with 52 distributors and associate dealers Aug. 20 totaled 763. Used car inventories are lower than ever before at this period and good used vehicles are selling rapidly.

Milwaukee

The outlook for passenger car trade is deemed exceedingly bright, and September sales are expected to mount up well ahead of a year ago. Many dealers at the end of August were behind on deliveries of their most popular models and types, and while shipments from the factories have been increasing steadily, with new cars swinging into high production, dealers do not look for any unbalance between stocks and sales. July sales of 11,432 make the total for the first seven months 57,098, against 57,164 in 1927. July sales last year numbered 7821. August sales last year were 8054, and the month just passed is expected to yield 10,000. While the heavy sale of new cars is making the used car accumulation heavier, it is a fact that a good many buyers are keeping their old cars for further use rather than accept the very low trade-in values quoted by dealers, who have been able to dictate terms without losing business to other lines. It has been a long time since the dealers have occupied so fortunate a position in this respect.

St. Louis

Both new and used car business was satisfactory during August, new car business being 15 per cent greater than during August last year. Stocks of new cars in warehouses are heavy, but are moving rapidly. Accessory dealers also reported a good month's business and collections were better than has been the case during the early summer.

New Orleans

New model cars are creating favorable comment, but the actual sales are very slow. Four prominent dealers are going out of business. Public favor centralizing on just a few lines of cars. Ford is showing considerable gain locally. The Ford assembling plant is turning out 135 cars a day and expects to operate two shifts soon.

Denver

The midsummer automobile show boosted August car sales. Crops in outlying territory are good, but prices are low and car buying is slow there. Collections are good and there are fewer used cars than last year.

Kansas City

August was a good month for automobile dealers. Economic conditions have encouraged buying while the new models offered have stimulated interest. Final figures for the month are expected to show between 12 and 20 per cent gain in units sold. The new models of the different manufacturers are meeting with much approval on the part of the public. In spite of the high production schedules announced by the manufacturers, there are no dealers here with an excess of cars on hand. There is no real used car prob-

lem among the dealers here. While some dealers have an excess of used cars on hand, the average is approximately 40 per cent under the usual number for this season. The large number of trade-ins on new models during the month naturally has tended to increase used car stocks.

Minneapolis

Business prospects for automobile dealers are the best for a long time. July was the eleventh consecutive month, according to the Federal Reserve Bank, in which the business of the states in the Ninth district was greater than in the corresponding month of last year. The prospects are based largely on crop estimates for 1928, the higher price of wool, etc. Distributors report much better trade than last year and that there is no chance as yet for dealers in the territory to stock new cars. One zone manager goes so far as to say it is the best July total the zone has ever known. City sales in the two large counties of the state are much higher.

Dallas

Some improvement is seen in the automotive business as the year neared the ninth month. New car demands are stronger, sales more frequent and contracts for future deliveries increasing. The cotton crop, estimated to be worth a half billion dollars in Texas, is coming on the market. Money is freer and credit easier. Dealers look for bigger sales for the remainder of the year. Actual new car sales in August 7 per cent greater than for July. Dealer stocks are normal, except in a few models and makes. In some instances certain models cannot be had in sufficient numbers to meet demands. Biggest sales in low and medium priced cars. Ford sales picking up as deliveries increase. Used car sales 7 per cent better.

San Francisco

August sales were approximately the same as those of July this year with exception of Ford and Chevrolet, which appear to have beaten last month considerably and to be well ahead of August last year. Used cars are moving better than any time in the last six months, but no one is able to explain the improvement. Trucks are going well in the smaller sizes. With the exception of one or two makes, the stocks of cars now in the hands of dealers are smaller than they were this time last year.

Seattle

New car sales for August were 20 per cent over sales for July, but approximately 5 per cent under sales for August, 1927. Prospects are that car sales for the first eight months of 1928 will be about 10 per cent under the same period of 1927.

Dealers, in most cases, are in a position to make immediate delivery of cars, now that the new fall models are on the market, although stocks are not sufficient for all requirements and some firms are booking orders for later delivery. Car requirements of dealers for the next quarter will be very heavy.

Dealers' stocks of used cars, on the average, are not as heavy as last year at this time, and prices are still strong.

Exports, Imports and Reimports of the Automotive Industry for Month of July of Current Year and Total for Seven Months Ending July, 1928

	Month of July 1927		Month of July 1928		Seven Months Ending July 1927		Seven Months Ending July 1928	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobile parts and accessories .....	..	\$30,210,100	..	\$44,704,387	..	\$242,296,450	..	\$293,350,027
Electric trucks and passenger cars	13	51,774	1	2,625	69	131,909	81	100,626
Motor trucks and buses, except elec. (total)	9,206	6,167,982	12,790	8,114,228	63,954	40,730,166	71,747	48,982,702
Up to 1 ton, inclusive	1,327	3,558,727	9,405	4,708,080	53,053	24,529,784	54,533	28,089,165
Over 1 and up to 2 1/2 tons	1,579	1,748,467	3,134	2,895,338	9,462	11,974,795	15,355	16,353,266
Over 2 1/2 tons	300	860,788	251	510,810	1,439	4,225,587	1,859	4,540,271
PASSENGER CARS								
Passenger cars, except electric (total)	19,398	13,872,553	38,880	23,655,757	179,179	131,029,498	233,221	163,899,518
Value up to \$500, inclusive	3,213	1,187,036	..	..	44,387	16,466,065	..	..
Value up to \$800	7,301	3,561,705	..	..	61,677	35,099,132	..	..
Value over \$800 up to \$1,200	5,941	4,812,717	..	..	48,168	42,492,482	..	..
Value over \$1,200 up to \$2,000	2,314	2,804,962	..	..	18,872	23,659,838	..	..
Value over \$2,000	629	1,506,133	..	..	5,475	13,311,981	..	..
PARTS, ETC.								
Parts, except engines and tires .....	..	..	..	..	..	..	..	..
Automobile unit assemblies .....	..	3,079,138	..	5,712,047	..	29,231,747	..	35,357,423
Automobile parts for replacement .....	..	5,542,647	..	5,077,794	..	28,156,847	..	30,165,830
Automobile accessories .....	..	658,906	..	788,383	..	5,049,461	..	5,497,169
Automobile service appliances (n. e. s.) .....	..	692,068	..	579,132	..	4,946,454	..	4,403,044
Trailers	35	22,241	75	22,555	500	223,586	425	164,893
Airplanes, seaplanes and other aircraft	1	11,534	17	231,705	20	323,144	103	1,172,459
Parts of airplanes, except engines and tires .....	..	30,973	..	243,549	..	220,151	..	770,644
BICYCLES, ETC.								
Bicycles and tricycles	648	16,012	393	10,246	2,858	79,706	3,023	86,706
Motorcycles	676	149,107	1,229	282,711	11,765	2,625,625	11,641	2,697,863
Parts, except tires .....	..	87,299	..	130,933	..	776,034	..	862,689
INTERNAL COMBUSTION ENGINES								
Stationary and Portable								
Diesel and Semi-Diesel	101	117,370	13	83,192	493	831,092	333	614,122
Other stationary and portable:								
Not over 10 Hp.	2,120	255,313	3,688	332,980	15,900	1,436,197	21,616	1,888,513
Over 10 Hp.	307	236,672	790	318,317	1,085	989,723	2,615	1,062,619
Automobile engines for:								
Motor trucks and buses	357	49,763	2,289	211,617	3,764	445,610	9,330	942,091
Passenger cars	5,849	767,337	10,841	1,141,936	71,757	7,521,212	80,732	8,404,668
Tractors	81	18,015	87	27,916	870	383,204	321	94,508
Aircraft	19	148,767	18	81,662	42	272,459	83	302,029
Accessories and parts .....	..	276,982	..	303,241	..	2,269,000	..	2,252,965
IMPORTS								
Automobiles and chassis (dutiable)	54	82,978	58	81,664	335	630,986	278	628,060
Other vehicles and parts for them (dutiable) .....	..	28,216	..	95,053	..	122,627	..	367,851
REIMPORTS								
Automobiles (free from duty)	19	24,848	16	25,093	115	175,619	147	162,636

Automotive Day Attracts
150,000 at Toronto Show

TORONTO, Aug. 28—Yesterday was automotive and good roads day at the Canadian National Exposition which opened here Aug. 24 and will continue until Sept. 8. Forty-one makes of passenger cars are being shown, occupying two special automobile buildings, while 20 makes of trucks and buses are on exhibition with 58 exhibits of automotive accessories and parts and equipment. Three British makers are showing, Rolls-Royce, Vauxhall and Morris, the latter having on display its new six and Junior 7. Airplanes and airplane equipment are being shown in a separate building, while tractors are being displayed in a tent city. Motorcycle booths are in the building with trucks and buses.

It has been announced that by next year there will have been erected the finest automotive display building in the world where every type of automotive product can be exhibited under one roof. Over 150,000 people attended the exposition on automotive day, total attendance during the life of the exposition being estimated at about 2,000,000.

Fageol Develops Exports

OAKLAND, CAL., Aug. 28—Fageol Motors Co. reports establishment of agencies in virtually all the countries surrounding the Pacific. Two years ago, the Fageol company started this campaign for foreign sales of trucks, stages and buses. The statement for the last half year shows net earnings for that period, after deducting depre-

ciation and reserves, of \$149,436. The consolidated balance sheet of the company shows current assets of \$2,367,053 and current liabilities of \$550,873.

Following the general statement, Fageol reported July sales the first month after the close of the fiscal year, of \$366,000, an increase of 33 1/3 per cent over July, 1927. Unfilled business for immediate delivery, as of July 31, is \$310,000.

French Car Exports Total
\$30,000,000 in First-Half

PARIS, Aug. 18 (by mail)—During the first six months of this year France exported 18,532 passenger cars and 2674 trucks, or a total of 21,206, having a value of approximately \$30,000,000. Algeria took the greatest number (4288), others in importance being Spain 3187, Great Britain 1665, Belgium 1574, Indo-China 1184, and Switzerland 941.

During the same period France imported 4330 passenger cars, trucks and tractors at a declared value of \$363,720. Numerically Italy headed the list with 1955 vehicles, compared with 1558 from the United States. The American automobiles, however, had more than twice the value of those from Italy.

Gabriel Retooling \$350,000

CLEVELAND, Aug. 28 — Gabriel Snubber Mfg. Co. plant is being retooled at a cost of \$350,000 for production of its new hydraulic shock absorber and production is expected to be well under way in October. Manufacture of the Gabriel snubber will be continued at the rate of 8000 or more a day.

U. S. Tire Exports Total
1,313,354 in First Half

WASHINGTON, Aug. 30—The United States led Canada by more than 500,000 automobile tire casings in exports during the first half of 1928 according to figures made public by the rubber division of the Department of Commerce. This country shipped 1,313,354 casings while Canada shipped 812,412 and the United Kingdom exported 360,842 during the first six months of 1928. Exports of French casings, which are estimated from reports on the weight of the shipments totaled approximately 856,700.

The four countries mentioned which supplied approximately 83 per cent of the total exports of 1927 during the first half year of 1928 sent out 3,343,308 casings, of which 1,336,433 went to Europe.

To Make Plane Engines

NEW YORK, Aug. 27—Aeronautical Products Corp. has been formed at Naugatuck, Conn., to make engines for light airplanes. Machinery valued at \$200,000 has been installed in the former Dunham Mills and production of 25 engines a day will be sought in the immediate future. H. Alex. Johnson of New York, is president; Clarence Austin, secretary, and Harris Whittemore, Jr., treasurer.

Moon Reports Coast Gain

ST. LOUIS, Aug. 28—Moon Motor Car Co. reports an increase of 140 per cent in its July sales on the Pacific Coast over the same month last year.

Air Line to Connect Chicago and Panama

CHICAGO, Aug. 25—Mail will be carried from Chicago to the Panama canal zone in airplanes on Jan. 1, it was announced yesterday by Lawrence W. Scudder, president of the Interstate Airlines of Chicago. This service will be made possible through the linking of new airmail lines which will operate into Havana, Cuba, across the straits of Yucatan into Mexico and on to Panama.

The interstate airline will initiate service early in the fall from Chicago to Atlanta, a distance of 623 miles. Mr. Scudder and a corps of aviation experts recently returned from Champaign, Danville, and Terre Haute, where they surveyed the proposed route of the line.

The second link in the service will be opened before the first of the year by the Pitcairn Aviation Co., Inc., of Philadelphia, and will extend from Atlanta to Miami, Fla., a distance of 622 miles.

Fuels Show Wide Range

WASHINGTON, Aug. 30—High test and anti-knock gasolines tested at the Bureau of Standards, convinced scientists that ordinary gasoline will serve just as well in warm weather, although the latter gives easier starting and less trouble from crankcase oil dilution in cold weather. A wide range in the knocking tendencies both of ordinary gasolines and anti-knock compounds was shown. The whole subject is discussed in the Technical News Bulletin of the bureau for August, in a brief article.

Coming Feature Issues of Chilton Class Journal Publications

Oct. 10—Marketing Annual for 1929—Motor World Wholesale.

Nov. 17—Production and Factory Equipment Issue—Automotive Industries.

German Tire Shipments Lower, Belgium Gains

WASHINGTON, Aug. 25—Germany exported 68,868 automobile casings during the first six months of 1928 as compared with 90,146 casings during the same period last year, according to figures of the rubber division of the Department of Commerce.

While a decided drop was being felt in German exports of casings, the department announces according to preliminary statistics, Belgium was shipping more than 50 per cent more casings during the 1928 half year. Belgium automobile casings exported were estimated at 215,407 for the first six months of 1928 as compared with 137,278 for the same period of 1927.

Banfield Sells Interest

TORONTO, Aug. 25—McQuay-Norris Mfg. Co. has purchased the entire interest of E. J. Banfield in the Canadian firm of McQuay-Norris Mfg. Co. of Canada, Ltd. For the past eight years Mr. Banfield has served as vice-president and general manager.

Western Bus Lines Form Association

LOS ANGELES, Aug. 27—Legislation designed to protect the traveling public from so-called "wildcat" bus transit lines was among the chief subjects of discussion at a meeting of Western bus operators held at Long Beach, Aug. 15 to 17. The meeting was called by the Motor Carriers' Association of California and was attended by about 200 delegates from all parts of the West. As a result of the gathering there will be formed an organization to be known as the Western States Motor Carriers' Association. A committee was appointed by President Charles Wren to effect the organization.

The association hopes to obtain Federal laws that will protect travelers from irresponsible bus operators who, in the past, have undertaken to carry passengers to distant points and through poor equipment or dishonest drivers, have forced their patrons to complete their journeys by other means. These practices, it was pointed out, have done great injury to the established motor coach transportation business.

Graham-Paige Wins Run

DETROIT, Aug. 27—A Graham-Paige won the Norwegian-Swedish annual automobile race this year, according to advices from the Graham-Paige factory. The race was held over the Oslo-Stockholm-Goteborg-Oslo course of 1550 miles. The car was piloted by Lief Mathieson, one of the best-known Scandinavian race drivers.

Calendar of Coming Events

SHOWS

Aeronautical Exposition, Coliseum, ChicagoDec. 1-9
American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
American Road Builders Association, Inc., Cleveland Auditorium...Jan. 14-18
American Society for Steel Treating, Commercial Museum, PhiladelphiaOct. 8-12
American Welding Society, Commercial Museum, PhiladelphiaOct. 8-12
Automotive Equipment Association, Coliseum, ChicagoOct. 22-27
BerlinNov. 8-18
Boston, Mass., Mechanics Bldg.March 2-9
BrusselsDec. 8-19
Buenos AiresNov. 29-Dec. 9
*Chicago, National Coliseum, Jan. 26-Feb. 2
International Aviation Exposition, BerlinOct. 8-28
London, passenger carsOct. 11-20
MontevideoNov. 10-19
National Air Races, Los Angeles...Sept. 11-12
National Standard Parts Association, Cleveland Auditorium...Oct. 29-Nov. 3
*New York, National, Grand Central PalaceJan. 5-12
Paris, passenger carsOct. 4-14
Paris, trucksNov. 15-25
PragueSept. 1-9
Salon, Automobile Salon, Inc., Hotel Drake, ChicagoJan. 26-Feb. 2
Salon, Automobile Salon, Inc., Hotel Biltmore, Los AngelesFeb. 9-16
Salon, Los Angeles Motor Car Dealers Association, Biltmore Hotel...Oct. 17-20
Salon, Automobile Salon, Inc., Hotel Commodore, New YorkDec. 2-8
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco...Feb. 23-Mar. 2

* Will have special shop equipment exhibit.

Toronto, Can.Aug. 24-Sept. 8
Western States Metal and Machinery Exposition, Los Angeles....Jan. 14-18

CONVENTIONS

American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
American Gear Manufacturers Ass'n, Statler Hotel, Buffalo, N. Y....Oct. 11-13
American Institute of Mining and Metallurgical Engineering, Metals Division, Benjamin Franklin, PhiladelphiaOct. 8-12
American Manganese Production, Association, Mayflower Hotel, WashingtonSept. 10-11
American Road Builders Ass'n, Inc., Cleveland AuditoriumJan. 14-18
American Society for Steel Treating, Commercial Museum, PhiladelphiaOct. 8-12
American Society for Steel Treating, Semi-Annual Meeting, Los AngelesJan. 14-18
American Welding Society, Commercial Museum, PhiladelphiaOct. 8-12
Automotive Equipment Association, Coliseum, ChicagoOct. 22-27
International Air Conference, WashingtonDec. 12-14
Machine Tool Congress, joint meeting with Machine Shop Practice Division, American Society of Mechanical Engineers, Cincinnati...Sept. 24-27
Mid-West Motor Truck Transportation Congress, Indianapolis...Oct. 23-26
Motor & Accessory Manufacturers Association Credit Managers Conference, Hotel Statler, Buffalo...Sept. 12-14
National Battery Manufacturers' Association, Ambassador Hotel, Atlantic CitySept. 20-21

National Highway Congress, Mexico CityOct. 3-6
National Metal Congress, Los AngelesJan. 14-18
National Research Council, WashingtonDec. 13-14
National Safety Council, National Congress, New YorkOct. 1-5
National Standard Parts Association, Hollenden Hotel, Cleveland, Oct. 29-Nov. 3
Ohio Council National Automobile Dealers Association, Hotel Gibson, CincinnatiSept. 13-14
Society of Industrial Engineers, Rochester, N. Y.Oct. 17-19
World Motor Transport Congress, RomeSept. 25-29

A. S. M. E.

Cincinnati, Oct. 22-25—Machine Shop Practice.
Cleveland, Sept. 17-20—Fuels.

S. A. E.

National

Chicago, Dec. 6-7—Aeronautics.
Detroit, Book-Cadillac, Nov. 22-23—Production.
Detroit, Book-Cadillac, Jan. 15-18—Annual.
Los Angeles, Sept. 11-12—Aeronautics.
Newark, Robert Treat Hotel, Oct. 17-19—Transportation.
New York, Hotel Astor, Jan. 10—Annual Dinner.

RACES

Great BritainSept. 22
SalemOct. 12